UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

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| IN THE MATTER OF: | ) | |
| | ) | |
| UNITED STATES | ) | FINAL ADMINISTRATIVE ORDER |
| DEPARTMENT OF THE NAVY: | ) | ON CONSENT |
| WASHINGTON NAVY YARD, | ) | U.S. EPA Docket Number: |
| DISTRICT OF COLUMBIA, | ) | RCRA-III-010-TH |
| | ) | |
| EPA I.D. No. DC9 17 002 4310, | ) | |
| | ) | |
| | ) | |
| | ) | Proceeding under Section |
| | ) | 7003 of the Resource |
| | ) | Conservation and Recovery |
| | ) | Act, as amended, 42 U.S.C. |
| | ) | §6973. |

**FINAL ADMINISTRATIVE ORDER ON CONSENT**

I hereby certify that the
Consent Order

A. L. Williams Jr.

ORIGINAL (Red)

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

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**FINAL ADMINISTRATIVE ORDER ON CONSENT**

# FINAL ADMINISTRATIVE ORDER ON CONSENT

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## FINAL ADMINISTRATIVE ORDER ON CONSENT

The parties to this Final Administrative Order on Consent ("Consent Order" or "Order"), the United States Environmental Protection Agency ("EPA") and the United States Department of the Navy, owner and operator of the Washington Navy Yard, in Washington, District of Columbia, having agreed to entry of this Consent Order, it is therefore ordered and agreed that:

## I. JURISDICTION

This Consent Order is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency ("EPA") by Section 7003 of the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984 (collectively referred to hereinafter as "RCRA"), 42 U.S.C. Section 6973. The authority vested in the Administrator has been delegated to the Regional Administrators by EPA Delegation No. 8-22-C dated March 20, 1985.

On March 22, 1985, the EPA granted the District of Columbia (the "District") authorization to operate a hazardous waste program in lieu of EPA, pursuant to Section 3006(b) of RCRA, 42 U.S.C. Section 6926(b). The District, however, does not have authority to enforce Section 7003 of RCRA. The District has been given notice of the issuance of this Consent Order pursuant to Section 7003(a) of RCRA, 42 U.S.C. § 6973(a).

ORIGINAL (Red)

This Consent Order is issued to Respondent [the United States Department of the Navy ("Navy")], the current owner of the Washington Navy Yard ("WNY") facility ("Facility"). Navy consents to and agrees not to contest EPA's jurisdiction to issue this Consent Order, compel compliance with this Consent Order in any subsequent enforcement proceeding, require Navy's compliance with the terms of this Consent Order, or impose sanctions for violations of this Consent Order.

Navy, a Department of the Executive Branch of the Federal government, is a generator of solid and/or hazardous waste and is subject to and must comply with Section 7003 of RCRA in the same manner and to the same extent as any person (as defined in Section 1004(15) of RCRA) is subject to such requirements, in accordance with Section 6001 of RCRA.

## II. PARTIES BOUND

A. This Consent Order shall apply to and be binding upon EPA, Navy and its agents, successors and assigns.

B. No change in ownership of any property covered by this Consent Order, or in the status of Navy, shall in any way alter, diminish, or otherwise affect Navy's obligations and responsibilities under this Consent Order.

C. Navy shall provide a copy of this Order to all Navy supervisory personnel and prime contractors retained to conduct or monitor any portion of the work performed pursuant to this Order within seven (7) days of the effective date of this Order or date of such retention, whichever is later, and shall condition all contracts with the aforementioned on compliance with the terms and conditions of this Order. All Navy personnel and contractors shall perform such work in accordance with the requirements of this Order. It shall not be a defense to any violation of this Consent Order that the supervisory personnel, contractor, subcontractor, laboratory or consultant committing the violation was not informed of the requirements of this Consent Order.

D. In the event of any change in ownership or operation of WNY, Navy shall notify EPA in writing of the nature of any such change no later than fifteen (15) calendar days after the effective date of such change. In addition, Navy shall provide a copy of this Consent Order to any successor to WNY at least fifteen (15) calendar days prior to the effective date of such change.

## III. STATEMENT OF PURPOSE

A. In entering into this Consent Order, the mutual objectives of EPA and Navy are: (1) to establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at or from (or both) the Facility; (2) to perform a RCRA Facility Investigation ("RFI") to determine fully the nature and extent of any release of hazardous wastes, solid wastes and/or hazardous constituents at or from the Facility; and (3) to perform a Corrective Measures Study ("CMS") to identify and evaluate alternatives for corrective action necessary to prevent or mitigate migration or releases of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility.

B. The Parties understand that the Washington Navy Yard (hereinafter Facility) will be proposed for listing on the National Priorities List ("NPL"). The Parties further understand that EPA will pursue listing the Facility on the NPL at the earliest possible time. Once the Facility is proposed for placement on the NPL, the Parties will negotiate an Interagency Agreement/Federal Facilities Agreement (IAG/FFA) as is required by Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), Section 120(e)(2), 42 U.S.C. 9620(e)(2). Upon finalization, the final signed IAG/FFA will supersede this Order, which will then terminate, and the response activities undertaken pursuant to this Order will continue under the auspices of CERCLA and the Defense Environmental Restoration Program("DERP").

## IV. FINDINGS OF FACT

The parties make the following Findings of Fact:

For purposes of this Consent Order, the following constitutes a summary of the findings upon which this order is based. The Navy, in accordance with Section I (Jurisdiction) consents to and agrees not to contest EPA's jurisdiction to issue this Consent Order. Nothing contained in this Consent Order shall constitute an admission of any liability by the Navy for any matters contained herein nor shall anything in this Consent Order constitute an admission by the Navy with respect to any Findings of Fact or any legal determination noted herein.

A. The Navy is subject to the requirements of Section 6001 of RCRA, 42 U.S.C. § 6961, including compliance with the requirements of RCRA in the same manner as a person, as defined in Section 1004(15) of RCRA, 42 U.S.C. § 6903(15).

B. The Washington Navy Yard (WNY) is a military installation and is currently located on approximately 63.3 acres of land in the southern portion of Washington D.C. Coverage of the Facility with buildings and other impervious surfaces is predominant. Approximately 2.7 acres of parkland are the only substantially vegetated areas in a largely urban setting. The original WNY was gradually built up to approximately 126.8 acres with the addition of filled land in response to the expansion of operations during the peak production era. The remaining 63.5 acres is currently owned by the General Services Administration (GSA). The area surrounding WNY is intensely urban in character, with industrial areas predominant along the waterfront. The WNY is bordered on the north by commercial and vacant commercial properties, on the south by the Anacostia River, on the west by the Southeast Federal Center (SEFC) owned by GSA, and on the east by an abandoned industrial area. The WNY has always been owned and operated by the United States Navy. Industrial development and ordnance production were the prevalent activities at the WNY from 1881 to the 1940s. In the 1940s the primary role shifted from manufacturing to administrative activities. Currently WNY consists of administrative, supply and storage buildings, residences, training facilities and museums.

C. Navy is a generator of hazardous waste and the owner and/or operator of the WNY facility located at 901 M Street SE, Washington, D.C. as part of the Naval District Washington ("NDW").

D. On February 13, 1985, the Navy submitted to EPA a Notification of Hazardous Waste Activity ("Notification") for the Naval District Washington, D.C., which is located at the Washington Navy Yard, pursuant to Section 3010 of RCRA, 42 U.S.C. § 6930. In the Notification, the Naval District Washington, D.C. identified itself as being a generator of hazardous wastes and polychlorinated biphenyls ("PCBs"). WNY was assigned EPA identification number DC9 17 002 4310.

E. The 1988 Preliminary Assessment Report for WNY, prepared by Naval Energy and Environmental Support Activity, ("NEESA") indicates the presence of petroleum releases. The NEESA report also indicates that oil was discovered in fill soil and ground water beneath Building 111. There are probably several sources of contamination both inside and outside of the building, including underground storage tanks, oil quenching tanks, and oil supply lines. Finally, excavations along Patterson Avenue revealed oil-contaminated soil stretching from Building 142 to Building 21.

F. A 1993 Preliminary Assessment (PA) Report for the WNY was conducted by Baker Environmental, Inc. under the Atlantic Division, Naval Facilities Engineering Command (LANTDIV) Comprehensive Long-Term Environmental Action Navy (CLEAN)

Program. The purpose of the PA was to identify potential contamination within the Navy Yard utilizing historical documents and maps, personnel interviews and discussions with state and federal agencies. The PA identified sixteen (16) areas of concern requiring further study based on past industrial and hazardous waste handling activities at the sites.

G. In September 1996, the Department of the Navy, Engineering Field Activity Chesapeake, Naval Facilities Engineering Command, Washington, D.C. submitted to EPA a final report entitled, SITE INVESTIGATION - WASHINGTON NAVY YARD, WASHINGTON, D.C. prepared by Baker Environmental, Inc. ("SI"). The SI addressed the following thirteen (13) sites,{Building 22 (Site 01); Building 33 (Site 02); Building 40/41 (Site 03); Building 46 [includes Buildings 46, 108 and 66/67](Site 04); Building 73 [includes Buildings 28, 73, 104, 143 and 176] (Site 05); Building 116 [includes Buildings 116/118 and 197] (Site 06); Building 126 (Site 07); Building 211 (Site 08); Building 219 [includes Buildings 219 and 220](Site 09); Building 290(Site 13); Building 292 (Site 14); the Former Incinerator Site (Site 11);and Admirals Row, which includes Quarters B through H, K through P, R through W, Y, Leutze Park and Building 1 (Site 10)}; one (1) Area of Concern (AOC) {AOC Building 201}, the Anacostia River immediately adjacent to the Facility and basewide monitoring wells.

H. Section 4.0 of the SI report compares sample analytical data to the relevant risk-based screening criteria, at Buildings 22, 33, 40/41, 46, 73, 116, 126, 201, 211, 219, 290 and 292, the Former Incinerator Site, the Anacostia River, WNY Basewide Monitoring Wells, and Admirals Row. The risk-based screening criteria used in the comparison, are:

1. For all soil data - EPA-Region III Risk-Based Concentrations (RBCs) for Industrial and Residential soils;

2. For groundwater data - EPA Maximum Contaminant Levels (MCLs) and, where MCLs are not available, Region III risk-based screening criteria; and

3. For sediment data - Incidence of Adverse Biological Effects within Ranges [Effects Range Low (ERL) and Effects Range Median (ERM)] of Chemical Concentrations in Marine and Estuarine Sediments.

I. The Navy evaluated all concentrations exceeding EPA's screening levels using a pre-remedial toxicological evaluation developed by the Navy to determine potential human health risks. That evaluation is found at Section 5 of the SI. The purpose of the evaluation was to estimate potential human health risks associated with exposure to environmental media resulting from existing conditions at the site. The Navy's evaluation is a preliminary screening mechanism used as part of the SI to

determine if either further investigations, removal actions, or no further action are warranted. The Navy determined that the dominant pathways assumed for the evaluation were the incidental ingestion of subsurface soil, surface soil, and groundwater.

J. The SI Report indicates that the risk-based screening criteria were exceeded for the contaminants noted in Attachment A. Sites evaluated in the SI and/or other sites that were recommended for removal action, further investigation, or no further action are as follows:

1. Building 58 was formerly used as a general store, public works building, and Marine Corps barracks. The suspected contaminant was a pesticide, used for termite treatment of excavated soil surrounding the building. Currently the building is being used as the Marine Corps Museum. The Navy determined that the termite treatment was the intended use of the pesticides in the soil surrounding the building, and viewed that this application was for its intended purpose and did not constitute a release of a hazardous substance.

2. Building 175 was formerly used as a proof and welding shop. The Navy determined that the vapor barrier in the building was a typical structural device used in civil projects and not indicative of a release, and therefore no longer a concern. A vapor barrier was also installed in the floor of the building. The contaminants of concern were contingent upon determining the purpose for installing a vapor barrier in the building. This building is currently being used for office space.

3. Site 01 included soil in the vicinity of Building 22. Building 22 was primarily used as a foundry, machine shop, and a laundry facility. Building 22 currently contains racquetball courts, a warehouse, and offices occupied by the Naval Criminal Investigative Service (NCIS) and Naval Welfare and Recreation (NWR). Metals, including arsenic, beryllium and iron, were detected in the subsurface soil above the EPA screening criteria for residential exposure.

4. Site 02 included soil and groundwater located around and under Building 33. Building 33 through the years was used as a gun carriage (cartridge) shop and machine shop. Building 33 is presently an empty warehouse. Metals, including arsenic, beryllium and iron, were detected in the subsurface soil above the EPA screening criteria for residential exposure. Methylene chloride and the metals beryllium, iron and manganese were detected in groundwater above MCL's.

5. Site 03 included soil and groundwater located around and in the grassy area where Building 40/41 was formerly located. Building 40/41 was formerly a plating and gun shop. Both buildings were demolished in the late 1970's and the location is

presently a grassy slope with trees and shrubs. Metals, including arsenic, beryllium and iron, were detected in the subsurface soil above the EPA residential screening criteria.

6. Site 04 included soil and groundwater around and under Buildings 46/66/67/108. Building 46 was used as cartridge case and metal pressing shop in the past. Currently the building contains the Navy Exhibit Center, shop, and warehouse. Building 66/67 is currently designated as building 67 but was formerly designated as building 67 in the northern end and building 66 in the southern end. The building was formerly used as a cartridge case, metal pressing shop, primer shop and furnace room. Building 66/67 is currently an Art Gallery. Building 108 was used for a anchor shop, cartridge case shop, and chemical laboratory. Building 108 is presently being used for administrative purposes. Metals, including arsenic, beryllium and iron, were detected in the subsurface soil and groundwater above the EPA residential screening criteria and MCL's. Methylene chloride, beryllium, iron, manganese and nickel were detected in groundwater above MCL's.

7. Site 05 included soil and groundwater around and under Building 73. Building 73 was formerly used as a gun mount shop and other metal fabricating and associated activities. Building 73 is currently used as storage. Benzo(a)pyrene and metals, including arsenic, beryllium, iron and lead, were detected in the soil above the EPA residential screening criteria. Methylene chloride, acetone, arsenic, beryllium, copper, iron, manganese, mercury and nickel were detected in groundwater above MCL's.

8. Site 06 included soil, groundwater, surface water and sediment around and under Buildings 116, 118 and 197. Building 116 and 118 have operated as the boiler house and Navy Yard Power Plant respectively. An incinerator was located just to the south of building 116. Building 197 was formerly a gun assembly shop. It is currently unoccupied and scheduled for renovation. Semivolatiles, including benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene, and metals, including arsenic, beryllium iron and lead, were detected in the soil above the EPA residential screening criteria. Methylene Chloride, benzene, bis(2-ethylhexyl)phthalate, arsenic, beryllium, cadmium, iron, lead, manganese and nickel were detected in the groundwater MCL's. Semivolatiles, PCBs, and metals were detected in either the surface water or sediment above the EPA screening criteria.

9. Site 07 included soil and groundwater adjacent to Building 126. Building 126 was formerly a receiving station laundry. Building 126 is currently the Security Office. Semivolatiles, including benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene, and

metals, including arsenic and beryllium, were detected in the soil above the EPA residential screening criteria. Methylene chloride, aluminum, arsenic, barium, beryllium, iron, manganese and vanadium were detected in the groundwater above MCL's.

10. Site 08 included soil surrounding Building 211. Building 211 was formerly a chemical storage area. It is currently used as the CPO Club. Semivolatiles, including benzo(a)pyrene, dibenzo(a,h)anthracene, and metals, including arsenic, beryllium and iron, were detected in the soil above the EPA residential screening criteria.

11. Site 09 included soil and groundwater surrounding Building 219 and 220. Building 219 was formerly a chemical laboratory and gauge laboratory. It is currently used as the Navy Standards Laboratory. Metals, including arsenic and beryllium, were detected in the soil above the EPA residential screening criteria. Beryllium and nickel were detected in the groundwater above MCL's.

12. Site 10 included soil located in the front yard and back yard of Admirals Row, Leutze Park, and Building 1. Admirals Row is the designation given to a group of buildings used as housing for officers in the Navy. These buildings currently house officers. Lead was detected in surface soil above the EPA screening criteria for residential exposure at several locations, up to a maximum of 18,700 mg/kg.

13. Site 11 included soil located at the former Incinerator Site. The incinerator site refers to an area located south of Building 166 and east of Building 218 where three former incinerators were located. This area is currently a parking lot. Semivolatiles, including benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene, and metals, including arsenic, beryllium, iron and lead, were detected in the soil above the EPA residential criteria.

14. Site 13 included the soil located around Building 290. PCBs were detected in low concentrations along the north and southeast side of the building below EPA residential screening criteria.

15. Site 14 included the soil around the perimeter of and interior surface water located undergrade Building 292. PCBs were detected in the soil along the southern perimeter of the building at one sampling location at 20 mg/kg, above EPA residential screening criteria.

16. Area of Concern Building 201 was investigated due to past and current Public Works operations and since it was slated to be part of a BRAC related construction project. It included subsurface soil and groundwater located along the east and southeastern side of the building. Metals, including arsenic, beryllium, iron and lead and PCB's were detected in the subsurface soil above the EPA residential criteria. Metals, including antimony, arsenic and lead, were detected in groundwater above MCLs.

17. Site 12 consists of the stormwater line running from the area of Site 4 to outfall 5. Site 12 contained elevated levels of heavy metals and PCBs. The potential source of this contaminated sediment may have included past releases from Site 4.

18. Site 15 consists of the stormwater line running from the area of Site 6 to outfall 10. Site 15 contained high levels of PCB contaminated sediment. The potential sources of this contaminated sediment may have included site 6 and offsite contaminated soil from the Southeast Federal Center, currently operated by GSA.

19. Based on the findings in the PA Report(1993), SI Report (September 1996) and/or the Special Sampling Investigation, Washington Navy Yard and Environs, prepared by EPA Region III, Environmental Programs Branch dated April 24 through 27, 1995 ("SSI"),

- Buildings 58, 175, 201, and Sites 01, 02, 03, 04, 07, 09, 13, were recommended by the Navy for no further action.

- Sites 05, 06, 08, 10, 11, 14, were recommended by the Navy for further investigation.

- Sites 12 and 15 were addressed by a single removal action by the Navy to eliminate potential releases from these two sites. For those actions, the Navy prepared the Closure Report Industrial Waste Line Cleanout, dated October 25, 1996.

- Sites 06, 10, and 14 have been proposed by the Navy for removal actions.

EPA will review and approve the Navy recommendations in accordance with Section VII (Work to be Performed) of this Consent Order.

K. The reports entitled The Restoration of the Anacostia River: The Report to Congress, submitted by EPA's Chesapeake Bay Program office in July 1992, and Sediment Contamination Studies of the Potomac and Anacostia Rivers, submitted by the Interstate

Commission on the Potomac River Basin, dated September 10, 1992 ("ICPRB Report") present the results of analyses of the effects of pollution on the Anacostia River and the Chesapeake Bay. The reports conclude that the river suffers from persistent water quality problems throughout the entire watershed, which runs from central Maryland to the Potomac. The river flows through some of the most densely populated and economically depressed areas of the Washington Metropolitan Area. Problems include high sediment, and bacteria loading generated and delivered from upstream as well as from the effects of combined sewer overflows. Concentrations of Lead (Pb), Cadmium (Cd), and Mercury (Hg), organics such as hydrocarbons (e.g., PAHs), PCBs and DDT, were documented near the Washington Navy Yard as well as other areas of the Anacostia river. Uncontrolled stormwater runoff and erosion from development throughout the watershed has exacerbated the problem. Fifty nine (59) point source permits to the Anacostia were identified, among them several major industrial sources. The portion of the Anacostia adjacent to WNY is tidal and is one of the widest points of the river. Debris from other sources along the river is periodically carried by wind and current to the Navy Yard.

L. Information relating to human and ecological concerns at WNY are set forth in Section IV.M. and N. and in Attachment A of this Order which is incorporated here by reference.

M. Each of the contaminants detected in the soil, groundwater, surface water and sediment sample analytical data results, referred to in these Findings of Fact and Attachment A, may have detrimental impacts on human health and/or the environment. The toxicological impact of these contaminants can be found in the Administrative Record which supports the issuance of this Consent Order.

N. The substances referred to in these Findings of Fact and Attachment A and those referred to in the Administrative Record may migrate from WNY to the receptors referred to above, as well as to other human and environmental receptors by way of soil, surface water, groundwater and air.

O. Based on the information described in these Findings of Fact and Attachment A, EPA has determined that there may be an imminent and substantial endangerment to human health and/or the environment due to releases of solid wastes, hazardous wastes and/or hazardous constituents at/or from the Facility.

## V. EPA'S CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact and Attachment A set forth above and Conclusions of Law set forth in this Section and upon EPA's review of information for the Administrative Record, EPA has determined that:

A. Navy is a Department of the Executive Branch of the Federal government and is subject to the requirements of Section 6001 of RCRA, 42 U.S.C. § 6961.

B. Navy is a "person" within the meaning of Section 1004(15) of RCRA, 42 U.S.C. § 6903(15).

C. The substances referred to in Section IV of this Consent Order are solid wastes and/or hazardous wastes within the meaning of Section 7003 of RCRA, 42 U.S.C. § 6973.

D. Based on the information described above, EPA has determined that there may be an imminent and substantial endangerment to human health or the environment due to releases of hazardous wastes and/or solid wastes at and/or from the Facility.

E. Navy, at the Facility, has contributed to the handling, storage, treatment and disposal of solid wastes and/or hazardous wastes, which may present an imminent and substantial endangerment to human health or the environment.

F. The actions required by this Consent Order are necessary to protect human health or the environment.

## VI. RCRA-CERCLA INTEGRATION

A. EPA and the Navy intend to integrate the Navy's CERCLA response obligations and RCRA corrective action obligations which relate to the release(s) of hazardous substances, hazardous wastes, pollutants or contaminants covered by this Order into this comprehensive Order. Therefore, the Parties intend that activities covered by this Order will achieve compliance with CERCLA, 42 U.S.C. Section 9601 et seq.; satisfy the corrective action requirements of RCRA Section 7003, 42 U.S.C. Section 6973; and meet or exceed all applicable or relevant and appropriate Federal and other laws and regulations, to the extent required by CERCLA Section 121, 42 U.S.C. Section 9621, and other applicable law.

B. Based upon the foregoing, the EPA and the Navy intend that any remedial action selected, implemented and completed under this Order will be protective of human health and the environment such that remediation of releases covered by this Order shall obviate the need for further corrective action under RCRA (i.e.,

no further corrective action shall be required)as well as further response actions under CERCLA. The EPA and Navy also agree that, with respect to releases of hazardous waste covered by this Order that may be associated with any future NPL portions of the Facility, RCRA, in particular RCRA corrective action requirements, shall be considered an applicable or relevant and appropriate requirement pursuant to CERCLA Section 121.

C. EPA and the Navy recognize that the requirement to obtain permits for CERCLA removal actions undertaken pursuant to this Order shall be as provided for in CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). EPA and the Navy further recognize that ongoing hazardous waste management activities at the Washington Navy Yard may require the issuance of permits under Federal and State laws. This Order does not affect the requirements, if any, to obtain such permits. However, if a permit is issued to the Navy for on-going hazardous waste management activities at the Facility, EPA shall reference and incorporate any appropriate provisions, including appropriate schedules (and the provisions for extension of such schedules), of this Order into such permit. With respect to those portions of this Order incorporated by reference into permits, EPA and the Navy intend that judicial review of the incorporated portions shall, to the extent authorized by law, only be reviewed under the provisions of CERCLA.

D. Nothing in this Order shall alter the Navy's authority with respect to removal actions conducted pursuant to CERCLA Section 104, 42 U.S.C. Section 9604.

## VII. WORK TO BE PERFORMED

EPA acknowledges that some of the tasks required by this Consent Order may have already been completed and that Navy may have available some of the information and data required by this Consent Order. This previously completed work may be used to meet the requirements of this Consent Order upon submission to, and formal approval by, EPA under the terms of this Order.

Pursuant to Section 7003 of RCRA, 42 U.S.C. § 6973, Navy agrees to perform the following acts in the manner and by the dates to be specified under this Section. The time frames set forth herein are necessary to accommodate the contracting procedures in which Navy as a federal facility is required to engage. All work undertaken pursuant to this Consent Order shall, as EPA deems appropriate, be performed in accordance with: the Scope of Work for a RCRA Facility Investigation set forth in Attachment B; the Scope of Work for a Corrective Measures Study set forth in Attachment C; RCRA and its implementing regulations; and relevant EPA guidance documents. These Scopes of Work attached to this Consent Order are incorporated herein by

reference, but EPA and Navy acknowledge that the Scopes of Work are standard-form documents intended to be tailored to each case, and that they have not been tailored to this case. Relevant guidance may include, but is not limited to, the "RCRA Facility Investigation (RFI) Guidance" (EPA 530/SW-87-001), "RCRA Ground Water Monitoring Technical Enforcement Guidance Document" (OSWER Directive 9950.1, September 1986), "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods," (SW-846), 3rd Edition, as updated, "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities" (EPA 530/SW-85-031, July 1986), and "QWRS Guidance for Preparing of QA Project plans" (QWRS-QA-1, May 1984). "Days" as used in this Consent Order shall mean calendar days unless otherwise specified.

EPA shall make every reasonable effort upon receipt of the documents to review and approve or to provide timely comments concerning those documents to the Navy based on the Milestones established in the Corrective Action Management Plan ("CAMP") as discussed in Section VII.G.

A. INTERIM MEASURES ("IM")

1. EPA acknowledges receipt of the Removal Action Memorandum dated June 4, 1996, for removals at outfalls 5 and 10 undertaken by the Navy pursuant to CERCLA. The Navy shall provide to EPA copies of the CERCLA action memorandums for time-critical removal actions and the CERCLA Engineering Evaluation/Cost Analysis ("EE/CAs") for non time-critical removal actions currently being undertaken at WNY at the sites listed in Section VII. A.1. Unless otherwise directed by EPA, the Navy shall immediately take such actions as are necessary and appropriate to address such release(s), which are consistent with the NCP and which are consistent with and integrated into any long-term remediation at the following sites: (a) Site 10 Admirals Row Lead Soil Abatement Removal Action, (b) Site 6 Coal Storage Yard PCB Abatement Removal Actions and (c) Site 14 Building 292 PCB Removal Action.

2. If at any time during the pendency of this Consent Order Navy obtains or discovers information concerning a release of any hazardous waste, solid waste or hazardous constituent at or from the Facility into the environment in addition to or different from that described in Section IV, "FINDINGS OF FACT" above, or in the Administrative Record, Navy shall:

a. Notify EPA as soon as practicable of the source, nature, extent, location and amount of such release, the endangerment posed by such release and the actions taken and/or to be taken to address such release;

b. Unless otherwise directed by EPA, immediately take such actions as are necessary and appropriate to address such release, which are consistent with the NCP and which are consistent with and integrated into any long-term remediation at the Facility;

c. Confirm the notification to EPA in writing within three (3) calendar days of providing oral notification; and

d. Report the actions taken and their results to EPA in writing within ten (10) calendar days of completion of said actions.

3. EPA will review the Description of Current Conditions report and other information available to EPA, and if appropriate, will select an interim measure(s) and notify Navy of the interim measure(s) selected. The Navy will implement these measures consistent with its CERCLA removal authority.

B. RCRA FACILITY INVESTIGATION ("RFI")

1. EPA acknowledges the receipt of the 1996 Final Site Investigation Report, which shall serve as the "Description of Current Conditions at the Facility," with the exception of the permit history and information on Sites 12 and 15 (Stormwater lines 5 and 10) which shall be submitted with the RFI Workplan.

2. Within ninety (90) calendar days of the effective date of this Consent Order, Navy shall submit to EPA a "Pre-Investigation Evaluation of Corrective Measures Technologies" report, and a Workplan for a RCRA Facility Investigation ("RFI Workplan"). The RFI Workplan is subject to approval by EPA and shall be developed in accordance with, at a minimum, the RFI Scope of Work contained in Attachment B.

3. The RFI Workplan shall be designed to determine the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes, solid wastes or hazardous constituents identified at or from the Facility. The RFI Workplan shall document the procedures Navy shall use to conduct those investigations necessary to: (a) characterize the potential pathways of contaminant migration; (b) characterize the source(s) of contamination; (c) define the degree and extent of contamination; (d) identify actual or potential human or ecological receptors; and (e) support the development of alternatives from which a corrective measure(s) will be selected by EPA. Schedules for response actions for all sites and for the rehabilitation of the outfalls shall be developed in accordance with Section VII.G and H. of this Order. Unless otherwise agreed, priority will be given to those Sites with the highest risk.

4. In accordance with the provisions of Attachments B and D, the RFI Workplan shall include: (a) a Project Management Plan; (b) a Data Collection Quality Assurance Plan; (c) a Data Management Plan; (d) a Health and Safety Plan; and (e) a Community Relations Plan and shall provide for the submission of a draft and final RFI report. Schedules for submission of documents required by Attachment B and this Order shall be established as set forth in Section VII.G. and H. of this Order.

5. Upon receipt of EPA approval of the RFI Workplan, Navy shall implement the EPA-approved RFI Workplan in accordance with the terms and schedule contained therein. Upon completion of implementation of the RFI Workplan, Navy shall submit to EPA for approval draft and final RFI Reports and draft and final Laboratory and Bench Scale Study Reports in accordance with the requirements and schedule contained in the EPA-approved RFI Workplan.

C. CORRECTIVE MEASURES STUDY ("CMS")

1. After EPA approval of the RFI Final Report, unless this Order shall have been superseded by a Federal Facilities Agreement pursuant to CERCLA Section 120 as described in Section III of this Order, the Navy shall conduct a Corrective Measures Study and submit a Draft CMS Report in accordance with CMS Scope of Work contained in Attachment C. Schedules for submission of documents required by Attachment C and this Order shall be established as set forth in Section VII.H. of this Order. The Navy shall, during the next annual CAMP revision following EPA approval of the RFI Final Report, propose milestones for execution and submission of the CMS report as set forth in Section VII.G. and H. of this Order.

2. Within thirty (30) calendar days of receipt of EPA's comments on the Draft CMS Report, Navy shall submit to EPA the Final CMS Report, revised to respond to all comments received from or remedy all deficiencies identified by EPA on the Draft CMS Report.

D. PUBLIC COMMENT AND PARTICIPATION

1. After approval of the Final CMS Report, EPA will make both the RFI Final Report and the Final CMS Report, a description of EPA's proposed corrective measure(s) and EPA's justification for proposing selection of such corrective measure(s) (the "Statement of Basis") available to the public for review and comment for at least thirty (30) calendar days.

2. Following the public review and comment period, EPA will notify Navy of the corrective measure(s) selected by EPA. If the corrective measure(s) selected by EPA after consideration of public comments is not the corrective measure(s) originally

proposed by EPA, EPA shall inform the Navy in writing of the reasons for such decision, and the Navy shall modify the RFI and/or CMS Final Reports if directed to do so by EPA, or, refer any disagreement with the selected corrective measure(s) for Dispute Resolution in accordance with the provisions of this Order.

E. CORRECTIVE MEASURE(S) IMPLEMENTATION

After selection by EPA of the corrective measure(s) and issuance of the Final Decision and Response To Comments (FDRTC), unless this Order shall have been superseded by a Federal Facilities Agreement as set forth in Section III of this Order, EPA shall provide a ninety (90) calendar day period to negotiate the terms of an administrative order on consent for implementation of such corrective measure(s). The ninety (90) day period shall begin on the date the FDRTC is published. If agreement is not reached during this period, EPA reserves all rights it has to implement the corrective measure(s) or other remedial response and to take any other appropriate actions under RCRA, CERCLA, or any other available legal authority.

F. SUBMISSIONS/EPA APPROVAL/ADDITIONAL WORK

1. EPA will review Navy's RFI Workplans, RFI and CMS Draft and Final Reports and any other documents submitted pursuant to Attachments B through D of this Consent Order ("Submissions"), with the exception of progress reports, and will notify Navy in writing of EPA's approval or disapproval of each such Submission. In the event of EPA's disapproval, EPA shall specify in writing any deficiencies in the Submission. Such disapproval shall not be subject to the dispute resolution procedures of Section XVII, below.

2. a. Within thirty (30) calendar days of receipt of EPA's comments on any other Submission, Navy shall submit to EPA for approval a revised Submission, which responds to any comments received or corrects any deficiencies identified by EPA. In the event that EPA disapproves of the revised Submission, Navy may invoke the dispute resolution procedures of Section XVII, below. In the event EPA disapproves the revised Submission, EPA reserves the right to revise such Submission. Any Submission approved or revised by EPA under this Consent Order shall be deemed incorporated into and made an enforceable part of this Consent Order.

b. In the event EPA and Navy cannot resolve issues relating to EPA's comments and the EPA disapproves of the second revised Submission, Navy may invoke the dispute resolution procedures of Section XVII, below. However, EPA reserves the right to revise such Submission and seek to recover from

Navy the costs of revising the second Submission in accordance with CERCLA and any other applicable law. Any Submission approved or revised by EPA under this Consent Order shall be deemed incorporated into and made an enforceable part of this Consent Order.

3. Beginning with the first day of the second full month following the effective date of this Consent Order, and every two months thereafter on the first day of the month, throughout the period that this Consent Order is effective, Navy shall provide EPA with bimonthly (every two months) progress reports. The bimonthly progress reports shall address the current status of work ongoing or planned for the Facility pursuant to the relevant Scope(s) of Work attached hereto.

4. Five (5) copies of all documents required to be submitted under the terms of this Consent Order shall be hand-delivered or sent by Overnight Mail to the Project Coordinator designated pursuant to Section XIV, "PROJECT COORDINATORS," below.

5. All work performed pursuant to this Consent Order shall be under the direction and supervision of a professional engineer or geologist with expertise in hazardous waste site investigation. Within fourteen (14) days after the effective date of this Consent Order, Navy shall submit to EPA, in writing, the name, title, and qualifications of the engineer or geologist and of any contractors to be used in carrying out the terms of this Consent Order. Navy shall notify EPA ten (10) days prior to selecting any subcontractors to be used in carrying out the terms of this Consent Order, and shall submit to EPA in writing, the name, title, and qualifications of such subcontractors. Notwithstanding Navy's selection of an engineer, geologist, contractor or subcontractor, nothing herein shall relieve Navy of its obligation to comply with the terms and conditions of this Consent Order. Navy shall notify EPA ten (10) days prior to changing voluntarily its engineer or geologist, or contractors or subcontractors to be used in carrying out the terms of this Consent Order, and shall submit to EPA in writing, the name, title, and qualifications of such persons(s).

6. EPA or Navy may determine that certain tasks and deliverables including, but not limited to, investigatory work or engineering evaluation require additional work. These tasks and deliverables may or may not have been in the RFI Workplans. If EPA determines that such additional work is necessary, EPA shall request, in writing, that Navy perform the additional work and shall specify the reasons for EPA's determination that additional work is necessary. Within fifteen (15) calendar days after the receipt of such request, Navy shall have the opportunity to meet or confer with EPA to discuss the additional work EPA has requested. Any additional work proposed by Navy shall be subject to approval by EPA. In the event that Navy agrees to perform the additional

work, this Consent Order shall be modified in accordance with Section XXIV, "SUBSEQUENT MODIFICATION," below, and such work shall be performed in accordance with this Consent Order. In the event Navy declines or fails to perform the additional work determined by EPA to be necessary, EPA reserves the right to order Navy to perform such additional work; to perform such additional work itself; and to disapprove of the RFI Workplan or the RFI or CMS Reports.

## G. DEADLINES AND CONTENTS OF CORRECTIVE ACTION MANAGEMENT PLAN

1. In order to ensure that the Work to be performed under this Order is accomplished in a timely manner, the Parties have agreed to establish Deadlines consisting of (i) Near Term Milestones for the current fiscal year (FY), the budget year (FY+1) and the planning year (FY+2); (ii) Out Year Milestones for the years occurring after the planning year until the completion of the cleanup or phase of the cleanup (FY+3 and beyond); and (iii) Project End Dates for the completion of major portions of the cleanup or for the cleanup as a whole.

a. "Deadline" or "Milestone" shall mean a time limitation specifically established or provided for under the terms of the Order or the Corrective Action Management Plan for performance of work and submittal of documents required by Attachments B & C to this Order (Deliverables). Deadlines shall include "Near Term Milestones," "Out Year Milestones" and "Project End Dates," as such terms are defined below.

b. "Near Term Milestones" shall mean the dates established by the Parties in the CAMP, in consultation with stakeholders, for the submittal of deliverables and performance of work within the current fiscal year (FY), the next fiscal year or "budget year" (FY+1) and the year for which the budget is being developed or "planning year" (FY+2).

c. "Out Year Milestones" shall mean the dates established by the Parties in the CAMP, in consultation with stakeholders, for the submittal of deliverables within those years occurring after the "planning year" until the completion of the cleanup or phase of the cleanup (FY+3 through Project End Date, as defined below).

d. "Project End Dates" shall mean the dates established by the Parties in the CAMP, in consultation with public stakeholders, for the completion of major portions of the cleanup or completion of the cleanup of the entire facility.

Near Term Milestones for performance of work and submittal of deliverables within the current fiscal year (FY) are enforceable and shall be subject to stipulated penalties. Near Term Milestones, Out Year Milestones and Project End Dates will not

change without the mutual consent of all Parties to the Order. Out Year Milestones and Project End Dates shall not be enforceable until they become Near Term Milestones for the current FY in accordance with the terms of Section VII.H.4. below; provided, however, that if an activity is fully funded in the current FY, milestones associated with deliverables resulting from such activity (even if they extend beyond the current FY) shall be enforceable. For the purposes of this Order, a fiscal year is the yearly time frame used by the United States Government that commences on October 1 and ends September 30th of the following calendar year.

2. Within thirty (30) days after the effective date of this Order, the Navy shall submit the CAMP for EPA's review and approval as set forth in this Section. Upon approval by EPA, the CAMP shall be implemented by the Navy. The CAMP establishes deadlines for a three-year period for the submittal of deliverables pursuant to this Order. The CAMP includes both RCRA and CERCLA proposed responses and actions. Section VI., "RCRA/CERCLA INTEGRATION" outlines all response activities and associated documentation to be undertaken at the Facility. The CAMP incorporates all Deadlines and Target Dates contained in approved Work Plans. All schedules approved in future Work Plans immediately become incorporated in the CAMP.

3. Deadlines in the CAMP reflect the priorities agreed to by the Parties, in consultation with stakeholders, through a process of "Risk Plus Other Factors" Priority Setting. Site activities have been prioritized by weighing and balancing a variety of factors including, but not limited to: (i) the DoD relative risk rankings for the Site; (ii) potential or future use of the Facility; (iii) ecological impacts; (iv) intrinsic and future value of affected resources; (v) cost effectiveness of the proposed activities; (vi) regulatory requirements; (vii) environmental justice considerations; and (viii) actual and anticipated funding levels. While deadlines should not be driven by budget targets, such targets should be considered. Furthermore, in setting and modifying deadlines, the parties agree to make every attempt to live within the budget targets established by the Navy.

4. The CAMP includes (and shall be amended annually to include):

a. Actions necessary to mitigate any immediate threat to human health or the environment;

b. A listing of all currently identified Sites, Interim Measures, and Operable Units covered or identified pursuant to this Order;

c. Activities and schedules for response actions planned for the three-fiscal-year period covered by the CAMP. Activities included, at a minimum, are:

-Enforceable Near Term Milestones for the performance of work and submittal of all deliverables in the three-year CAMP period;

-Out Year Milestones for all deliverables covered in the CAMP for the years FY+3 through the Project End Date;

-Schedule for initiation of planned response action(s) covered by this Order; and

-Project End Dates for the completion of any planned response action(s) covered by this Order;

d. If the development of a deliverable is fully funded in the first year of the three-year period covered by the CAMP, enforceable Deadlines for submittal of that draft deliverable may extend beyond the current FY period covered by the CAMP.

5. The CAMP shall be amended on a yearly basis as provided in Section VII.H., "BUDGET DEVELOPMENT AND AMENDMENT OF CORRECTIVE ACTION MANAGEMENT PLAN". All subsequent Amendments to the CAMP shall meet all of the requirements set forth in this Section.

6. The enforceable Deadlines established pursuant to this Section and Section VII.H., "BUDGET DEVELOPMENT AND AMENDMENT OF CORRECTIVE ACTION MANAGEMENT PLAN," shall be published by EPA and shall be incorporated into the CAMP attached to this Order.

7. The Deadlines established in accordance with this Section and Section VII.H., "BUDGET DEVELOPMENT AND AMENDMENT OF CORRECTIVE ACTION MANAGEMENT PLAN" may be extended during the CAMP review process by following Section VII. H.4-H.7. The Parties recognize that possible bases for extension of Deadlines include: (i) the identification of significant new site conditions at this installation; (ii) reprioritization of activities under this Consent Order caused by changing priorities or new site conditions elsewhere in the Navy; and (iii) reprioritization of activities under this Consent Order caused by budget adjustments.

8. The Parties agreed to this language in this Section with the understanding that it will be revised in accordance with the results of the National EPA/Navy negotiations for the Alleghany Ballistics Laboratory (ABL)"Deadlines and Contents of Site Management Plan", "Budget Development and Amendment of Site Management Plan", and "Funding" provisions of the Agreement.

## H. BUDGET DEVELOPMENT AND AMENDMENT OF CORRECTIVE ACTION MANAGEMENT PLAN

1. The Department of the Navy, as a federal agency, is subject to fiscal controls, hereinafter referred to as the Future Year Defense Plan (FYDP). The first year of the FYDP is the year for which the next budget will be developed. The process for reviewing and adjusting the FYDP to (i) meet program requirements and, (ii) conform to OMB fiscal plans is called the Program Objectives Memorandum ("POM") process. The Parties recognize that planning, programming, and budgeting is a multi-year process. The Parties also agree that both parties should be involved in the full cycle of planning, programming, and budgeting activities.

### Facility-Specific Planning, Programming and Budgeting

2a. In order to ensure effective involvement by the Parties in the planning, programming, and budgeting process, the Navy agrees to meet, at the Project Coordinator level, with the other Parties for the purpose of reviewing the FYDP controls, developing a list of requirements/work to be performed at the Facility for inclusion in the Navy POM process, and participating in development of the Engineering Field Activities Chesapeake ("EFA Ches") submission to the proposed President's budget based on POM decisions for the year currently under consideration. This consultation must occur at least sixty (60) days prior to EFA Ches' initial budget submission to Naval Facilities Engineering Command (NAVFAC).

2b. In the event that the Project Coordinators cannot agree on activity funding levels that will (i) ensure protection of human health and the environment, and (ii) fit within overall FYDP controls, the Parties agree to make reasonable efforts to informally resolve these disputes, either at the immediate or secondary supervisors level, which would include discussions with NAVFAC. If resolution cannot be achieved informally within a reasonable period of time, EFA Ches shall resolve the disagreement, if possible with the concurrence of all Parties and notify each Party. If all Parties do not concur in the resolution, EFA Ches, through NAVFAC, agrees to elevate the budget request to the Office of the Chief of Naval Operations (OCNO) (after incorporating as much input from the Parties as possible) and inform OCNO of the possibility of future enforcement action should the money requested not be sufficient to perform the work in dispute. In addition, if EFA Ches' budget submission to NAVFAC does not include sufficient funds to complete all work in the existing CAMP, after any agreed upon modifications, the Navy's budget submission shall also include supplemental reports that fully disclose the additional work

required, but not included in the budget request. These supplemental reports shall accompany the cleanup budget that the Navy submits from EFA Ches through successive levels of the Navy to OCNO and to the DoD Comptroller.

EFA Ches-Budget

3a. It is understood by all Parties that EFA Ches will coordinate the development of their budget with representatives of the EPA Region III located within the geographical area administered by EFA Ches.

3b. The Navy shall forward to EPA Region III documentation of the budget requests (and any supplemental reports as outlined in Section H.1. above) for the Facility, as submitted by EFA Ches to NAVFAC, and by NAVFAC to Navy, within fourteen (14) days after the submittal of such documentation to Navy.

Amended Corrective Action Management Plan

4a. No later than June 15 of each year after the development of the CAMP, the Navy shall submit a draft Amended CAMP to EPA Region III which will propose Deadlines to take effect in the next FY. Unless the Parties agree to modify the Deadlines as provided below, the draft Amended CAMP should carry forward all Near Term Milestones, Out Year Milestones and Project End Dates included in the existing CAMP. Therefore, in most cases, Near Term Milestones in the existing CAMP for FY+1 and FY+2 shall be proposed as the Near Term Milestones for FY and FY+1 in the draft Amended CAMP. In addition, the Navy shall examine the newly proposed FY and FY+1 milestones, funding circumstances (including OMB targets/guidance), and "risk plus other factors" outlined in Section G.3. to evaluate whether the previously agreed upon Project End Dates and Out Year Milestones for FY+3 (i.e., what is FY+3 under the existing CAMP and will become FY+2 under the Amended CAMP) should become enforceable Near Term Milestones.

4b. Any proposed changes to Milestones must be explained in a cover letter to the draft Amended CAMP. Moreover, any changes to Near Term Milestones, Out Year Milestones or Project End Dates require the agreement of all Parties, in consultation with public stakeholders. The draft Amended CAMP should reflect any decisions made by the Parties during the planning, programming, and budgeting consultation process outlined in Section VII.H.2., above and shall be based upon the assumption that all remedial requirements for the Facility submitted during the development of the President's budget for the upcoming fiscal year will be fully funded. Any disagreement over adjustment of Deadlines pursuant to this Section shall be resolved in the context of the draft final amendment to the CAMP. The yearly Amendment to the CAMP will incorporate any newly finalized Sites, Interim Measures, or Operable Units identified pursuant to this Order.

5a. Both Parties shall meet as necessary to discuss the draft Amended CAMP. Within thirty (30) days of receipt of the draft Amended CAMP, EPA shall review the draft Amended CAMP and provide comments to the Navy. If EPA submits comments and are not satisfied with the draft Amended CAMP, the Parties will meet within fifteen (15) days of Navy's receipt of comments on the draft Amended CAMP to discuss and finalize the draft Amended CAMP.

5b. Within thirty (30) days of receipt of EPA's comments on the draft Amended CAMP, the Navy shall, as appropriate, make revisions and issue a revised draft, hereinafter referred to as a draft final CAMP. Following receipt of the draft final CAMP, EPA has thirty (30) days to approve or disapprove of the draft final CAMP. If EPA disapproves the draft final CAMP, the Navy shall have twenty (20) days from receipt of notice of disapproval to invoke dispute resolution directly to the SEC or amend the CAMP in conformance with EPA's comments.

6. It is understood by both Parties that the Navy will work with representatives of EPA Region III to reach consensus on the reprioritization of work made necessary by any yearly appropriation shortfalls or other circumstances as described in Section G.7.

7a. Within forty-five (45) days after EFA Ches has received official notification of EFA Ches' allocation based on the current year's Navy Environmental Restoration (ER,N) appropriation, the Navy shall determine if planned work (as outlined in the draft final CAMP) can be accomplished with the allocated funds. If the allocated funds are sufficient to complete all planned work for that fiscal year and no changes to the draft final CAMP are required, the Navy shall immediately forward a letter to EPA indicating that the draft final CAMP has become the final CAMP.

7b. In the event that the Navy determines within the forty-five (45) day period specified above that the allocated funds are not sufficient to accomplish the planned work for the Site (an appropriation shortfall), the Navy shall immediately notify the Parties and the Project Coordinators shall meet within thirty (30) days to determine if planned work (as outlined in the draft final CAMP) can be accomplished through: 1) rescoping or rescheduling activities in a manner that does not cause previously agreed upon Near Term Milestones and Out Year Milestones to be missed; or 2) developing and implementing new cost-saving measures. If, during this thirty (30) day consultation period, the Parties determine that rescoping or implementing cost-saving measures are not sufficient to offset the appropriation shortfall and the Parties agree that Near Term Milestones, Out Year Milestones and Project End Dates should be modified, the Parties shall discuss these changes and develop

modified Deadlines. Such modifications shall be based on the "Risk Plus Other Factors" prioritization process discussed in Section VII.G.3., above. If agreement on appropriate

modifications cannot be reached among the Parties, EPA retains its authority to disapprove a request to modify or extend existing Schedules and Deadlines.

7c. The Navy shall submit a revised draft final CAMP within thirty (30) days of the end of the consultation period. The revised draft final CAMP shall reflect EPA input during the consultation period outlined above. EPA shall have twenty-one (21) days to review the revised draft final CAMP. If EPA concurs with any modifications made in the revised CAMP, EPA shall notify the Navy in writing of their concurrence and the revised draft final CAMP shall become the final CAMP.

7d. If following the twenty-one (21) day review period for the revised draft final CAMP, the Parties fail to agree on the content of the revised draft final CAMP, the matter shall immediately be submitted directly to the SEC level for dispute resolution pursuant to Section XVII., "DISPUTE RESOLUTION." Within twenty (20) days after the conclusion of Dispute Resolution, the Navy shall revise and reissue as necessary, the Final CAMP. The pendency of any dispute under this Part shall not affect the timely adherence to the terms of this Order, including schedules, except as specifically provided herein. Enforceable deadlines established in the Final CAMP are subject to stipulated penalties in accordance with Section XVI., "DELAY IN PERFORMANCE/ STIPULATED PENALTIES," of this Order.

7e. The Parties agreed to this language in this Section with the understanding that it will be revised in accordance with the results of the National EPA/Navy negotiations for the Alleghany Ballistics Laboratory (ABL)"Deadlines and Contents of Site Management Plan", "Budget Development and Amendment of Site Management Plan", and "Funding" provisions of the Agreement.

## VIII. QUALITY ASSURANCE

Throughout all sample collection and analysis activities, Navy shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, as specified in the EPA-approved workplans. In addition, Navy shall:

A. Ensure that laboratories used by Navy for analyses perform such analyses according to the EPA methods included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (SW-846), 3rd Edition, as updated or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, Navy shall submit all analytical protocols to be used for

analyses to EPA for approval at least thirty (30) days prior to the commencement of analyses and shall obtain EPA approval prior to the use of such analytical protocols.

B. Ensure that laboratories used by Navy for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA.

C. Inform the EPA Project Coordinator at least fourteen (14) calendar days in advance of any laboratory analysis regarding which laboratory will be used by Navy and ensure that EPA personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analysis.

## IX. PUBLIC REVIEW OF ADMINISTRATIVE RECORD

The Administrative Record supporting the issuance of this Consent Order and any decisions or determinations made by EPA pursuant to the Consent Order will be available for public review on Mondays through Fridays, from 8:00 a.m. to 4:30 p.m., by contacting the EPA Project Coordinator, Vernon Butler, at:

U.S. Environmental Protection Agency
Region III (3HW90)
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431
Telephone: 215-566-3425

## X. PUBLIC COMMENT AND RELATED SUBSEQUENT MODIFICATIONS

Within thirty (30) calendar days of the date that EPA signs this Consent Order, EPA shall announce the availability of this Consent Order to the public for review and comment. EPA shall accept comments from the public for a period of thirty (30) calendar days after such announcement. If sufficient interest warrants, as determined by EPA, a public meeting will be held. At the end of the comment period, EPA shall review all comments received during the above-defined 30-day period and/or at such public meeting, and shall either:

A. Determine that the Consent Order should be made effective in its present form in which case EPA shall so notify Navy in writing and send Navy a copy of this Consent Order executed by EPA. The Consent Order shall become effective on the date of the receipt of such notice and copy of the Consent Order; or

B. Determine that modification of the Consent Order is necessary, in which case EPA shall notify Navy in writing as to the nature of all required changes. If Navy agrees to the modifications, the Consent Order shall be so modified and shall become effective upon the receipt by Navy of an executed copy of the modified Consent Order.

In the event that the Parties are unable to agree on modifications required by EPA as a result of public comment, this Consent Order shall be withdrawn by EPA. In such an event, EPA reserves the right to take such action as may be necessary to protect human health and the environment, including but not limited to, issuance of a subsequent order or civil action to Navy or any other person in connection with the Facility under Section 7003 of RCRA.

## XI. ONSITE AND OFFSITE ACCESS

A. EPA and/or its authorized representatives shall have the authority to enter and move about the Facility at all reasonable times for any purpose consistent with this Order including, among other things:

1. Interviewing Facility personnel and contractors;

2. Inspecting and copying records, operating logs, contracts, other documents and photographs relevant to the implementation of this Order;

3. Reviewing the progress of the Navy and/or its contractors in implementing this Order;

4. Conducting such tests, sampling or monitoring as EPA deems necessary; and

5. Verifying data submitted to the EPA by the Navy.

The Navy shall honor all requests for such access by EPA conditioned only upon presentation of proper credentials. However, such access shall be obtained in conformance with Navy security regulations and in a manner minimizing interference with any military operation at WNY. EPA and its authorized representatives recognize that the Facility is a National Security installation, thereby requiring that EPA refrain from using cameras or recording devices at the Facility without the prior permission of the Navy. Such permission shall not be unreasonably withheld. The Navy shall provide an escort whenever EPA requires access to the Facility for purposes consistent with the provisions of this Order. EPA shall provide reasonable notice to the Navy's Project Coordinator to request any necessary escorts. Should the Navy determine it will be necessary to deny

access, the Navy shall provide an explanation at the time of denial and, to the extent possible, provide a recommendation for accommodating the requested access in an alternative manner. Such denial shall be subject to the Dispute Resolution provisions of this Order.

B. To the extent that work required by this Consent Order, or by any approved Scope(s) of Work or Workplan prepared pursuant hereto, must be done on property not owned or controlled by the Navy, the Navy shall use its best efforts to obtain site access agreements from the present owner(s) and/or lessee(s) of such property, as appropriate, within thirty (30) calendar days of receipt of EPA approval of any Scope of Work or Workplan pursuant to this Order. The term "best effort," as used in this paragraph, shall include at a minimum, but shall not be limited to, a certified letter from the Navy to the present owner(s) and/or lessee(s) of such property requesting access agreements to permit the Navy, EPA, and its authorized representatives to access such property. In the event that agreement for access are not obtained within thirty (30) calendar days after receipt of EPA approval of any Scope of Work or Workplan pursuant to this Order which requires work on property which is not owned or controlled by the Navy, the Navy shall notify EPA in writing within seven (7) calendar days after failure to obtain such agreements regarding both the efforts undertaken to obtain access and the failure to obtain such agreements.

## XII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. Navy shall submit to EPA the results of all sampling or tests or other data generated by, or on behalf of, Navy in accordance with the requirements of this Consent Order and the Attachments appended hereto and incorporated herein. Navy shall have access to all sampling and test data generated by EPA in accordance with the requirements of this Consent Order and its Attachments, after such data has undergone Quality Assurance/Quality Control by EPA.

B. Navy shall notify EPA, in writing, at least fourteen (14) calendar days in advance of any field activities, such as well drilling, installation of equipment, or sampling. At the request of EPA, Navy shall provide or allow EPA or its authorized representatives to take split or duplicate samples of all samples collected by Navy pursuant to this Consent Order. In the event that EPA obtains samples for analysis, EPA shall provide to the Navy a portion of each such sample equal in volume or weight to the portion retained by EPA. If any analysis is made of such samples, a copy of the results of such analysis shall be furnished promptly to Navy. Navy shall permit such persons to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, that

pertain to work undertaken pursuant to this Consent Order. Nothing in this Consent Order shall limit or otherwise affect EPA's authority to collect samples pursuant to applicable law, including, but not limited to, RCRA and CERCLA.

C. If Navy wishes to assert a privilege with regard to any document which EPA seeks to inspect or copy pursuant to this Consent Order, Navy shall identify the document, the privilege claimed, and the basis therefor in writing. For the purposes of this Consent Order, privileged documents are those documents exempt from discovery from the United States in litigation under the Federal Rules of Civil Procedure. Navy shall not assert a privilege with regard to analytical, sampling and monitoring data generated pursuant to the requirements of this Consent Order.

## XIII. RECORD PRESERVATION

Navy agrees that it shall preserve all data, records and documents in its possession or in the possession of its divisions, officers, directors, employees, agents, contractors, successors, and assigns which relate in any way to this Order or to hazardous waste management or disposal at the Facility as required by the administrative record provisions of the NCP.

## XIV. PROJECT COORDINATORS

A. EPA hereby designates Vernon Butler as the EPA Project Coordinator. Within ten (10) calendar days of the effective date of this Consent Order, Navy shall notify EPA, in writing, of the Project Coordinator it has selected. Each Project Coordinator shall be responsible for overseeing the implementation of the Consent Order. The EPA Project Coordinator will be EPA's primary designated representative for the Facility. To the maximum extent possible, all communications between Navy and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Consent Order, shall be directed through the Project Coordinators.

B. Each party agrees to provide at least seven (7) calendar days written notice to the other party prior to changing Project Coordinators.

C. If EPA determines that conditions or activities at the Facility, whether or not in compliance with this Consent Order, have caused or may cause a release or threatened release of hazardous wastes, solid wastes, hazardous constituents, hazardous substances, pollutants or contaminants which threaten or may pose a threat to human health or the environment, EPA may direct that Navy stop further implementation of this Consent Order for such

period of time as may be needed to abate any such release or threatened release or to undertake any action which EPA determines is necessary to abate such release or threatened release.

D. Minor modifications in the studies, techniques, procedures, designs or schedules utilized in carrying out this Consent Order, which are consistent with the objectives of this Consent Order and necessary for the completion of the project, may be made by mutual agreement of the Project Coordinators. Such modifications shall be made by exchange of letters by the Project Coordinators and shall have as an effective date the date on which the letter from the EPA Project Coordinator is signed.

E. The absence of the EPA Project Coordinator at the Facility shall not be cause for the delay or stoppage of work.

## XV. NOTIFICATION

A. Unless otherwise specified, reports, correspondence, approvals, disapprovals, notices, or other submissions relating to or required under this Consent Order shall be in writing and shall be sent as follows:

1. One original and four (4) copies to:

Mr. Vernon Butler (3HW90)
U.S. EPA, Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

2. Documents to be submitted to Navy shall be sent to:

Armalia Berry (181)
Engineering Field Activity Chesapeake
Washington Navy Yard Bldg 212
901 M Street SE
Washington D.C. 20374-5018

Elizabeth Freese
Naval District Washington
Washington Navy Yard
901 M Street SE
Washington D.C. 20374-5018

3. Two copies of all documents to be submitted to EPA shall also be sent to:

Angelo Tompros
Government of The District of Columbia
Department of Consumer and Regulatory Affairs
Environmental Regulation Administration
Hazardous Waste Management Branch
2100 Martin Luther King, Jr. Avenue, S.E.
Suite 203
Washington, D.C. 20020-5732

B. Any notice, report, certification, data presentation, or other document submitted by Navy pursuant to this Consent Order which discusses, describes, demonstrates, supports any finding or makes any representation concerning Navy's compliance or noncompliance with any requirement of this Consent Order shall be certified by a duly authorized representative of Navy. A person is a "duly authorized representative" only if: 1. the authorization is made in writing; 2. the authorization specifies either an individual or position having responsibility for overall operation of the regulated facility or activity (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and 3. the written authorization is submitted to the Project Coordinator designated by EPA in Section XIV., "PROJECT COORDINATORS" of this Consent Order.

C. The certification required by paragraph B, above, shall be in the following form:

> I certify that the information contained in or accompanying this **[type of submission]** is true, accurate, and complete.
>
> As to [the/those identified portion(s)] of this **[type of submission]** for which I cannot personally verify **[its/their]** accuracy, I certify under penalty of law that this **[type of submission]** and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature : _____

Name : _____

Title : _____

## XVI. DELAY IN PERFORMANCE/STIPULATED PENALTIES

A. Unless there has been a written modification of a compliance date by EPA, or excusable delay as defined below in Section XVIII., "FORCE MAJEURE AND EXCUSABLE DELAY," in the event that Navy fails to comply with any requirement set forth in this Consent Order, Navy shall pay stipulated penalties, as set forth below, upon receipt of written demand by EPA. Compliance by Navy shall include commencement or completion, as deemed appropriate by EPA, of any activity, plan, study or report required by this Consent Order in an acceptable manner and within the specified time schedules in and approved under this Consent Order. Stipulated penalties shall accrue as follows:

1. For any failure to commence, perform or complete work as prescribed in this Consent Order: $3,000 per day for one to seven days or part thereof of noncompliance, and $5,000 per day for each day of noncompliance, or part thereof, thereafter;

2. For any failure to submit any draft or final workplans, plans, or reports as required by this Consent Order: $3,000 per day for one to seven days or part thereof of noncompliance, and $5,000 per day for each day of noncompliance, or part thereof, thereafter; and

3. For any failure to submit other deliverables as required by this Consent Order: $1,000 per day for one to seven days or part thereof of noncompliance, and $2,000 per day for each day of noncompliance, or part thereof, thereafter.

B. Upon determining that the Navy has failed in a manner set forth in Section XVI.A., EPA shall so notify the Navy in writing. If the failure in question is not already subject to dispute resolution at the time such notice is received, the Navy shall have fifteen (15) days after receipt of the notice to invoke dispute resolution on the question of whether the failure did in fact occur. The Navy shall not be liable for the stipulated penalty assessed by EPA if the failure is determined, through the dispute resolution process, not to have occurred. No assessment

of a stipulated penalty shall be final until the conclusion of dispute resolution procedures related to the assessment of the stipulated penalty.

C. The annual reports required by CERCLA Section 120(e)(5), 42 U.S.C. Section 9620(e)(5), shall include, with respect to each final assessment of a stipulated penalty against the Navy under this Order, each of the following:

1. The Facility responsible for the failure;

2. A statement of the facts and circumstances giving rise to the failure;

3. A statement of any administrative or other corrective action taken, or a statement of why such measures were determined to be inappropriate;

4. A statement of any additional action taken by or at the Facility to prevent recurrence of the same type of failure; and

5. The total dollar amount of the stipulated penalty assessed for the particular failure.

D. Stipulated penalties assessed pursuant to this Section shall be payable only in the manner and to the extent expressly provided for in Acts authorizing funds for, and appropriations to, the DoD.

E. This Section shall not affect the Navy's ability to obtain an extension of a timetable, deadline or schedule pursuant to Section XXIV., "SUBSEQUENT MODIFICATION".

F. Nothing in this Order shall be construed to render any officer or employee of the Navy personally liable for the payment of any stipulated penalty assessed pursuant to this Section.

## XVII. DISPUTE RESOLUTION

A. Except as specifically set forth elsewhere in this Order, if a dispute arises under this Order, the procedures of this Section shall apply. All Parties to this Order shall make reasonable efforts to informally resolve disputes at the Project Coordinator or immediate supervisor level. If resolution cannot be achieved informally, the procedures of this Section shall be implemented to resolve a dispute.

B. Within thirty (30) days after any action which leads to or generates a dispute, the disputing party shall submit to EPA a written statement of dispute setting forth the nature of the

dispute, the work affected by the dispute, the disputed party's position with respect to the dispute and the information they are relying upon to support its position.

C. Upon receipt of the written statement of dispute, EPA and the Navy shall engage in informal dispute resolution among the Project Coordinators and/or their immediate supervisors. They shall have fourteen (14) business days to resolve the dispute. During this informal dispute resolution period, the EPA and the Navy shall confer as many times as are necessary to discuss and attempt resolution of the dispute. If at the conclusion of the fourteen (14) business day period the EPA and the Navy cannot resolve the dispute, either side shall have ten (10) business days from the conclusion of the fourteen (14) business day dispute resolution period to present the dispute to the Dispute Resolution Committee as set forth in Section XVII.D. If neither EPA nor the Navy elevates the dispute within the ten (10) business day period, the Navy shall be deemed to have agreed with EPA's position with respect to the dispute.

D. The Dispute Resolution Committee (DRC) will serve as a forum for resolution of disputes for which agreement has not been reached through informal dispute resolution. The Parties shall each designate one individual and an alternate to serve on the DRC. The individuals designated to serve on the DRC shall be employed at the policy level (Commanding Officer, or equivalent) or be delegated the authority to participate on the DRC for the purposes of dispute resolution under this Order. The EPA's representative on the DRC is the Hazardous Waste Management Division Director of EPA Region III. The Navy's designated member is the Commanding Officer, Engineering Field Activity Chesapeake, Naval Facilities Engineering Command. Written notice of any delegation of authority from the Party's designated representative on the DRC shall be provided to all other Parties.

E. Following elevation of a dispute to the DRC, the DRC shall have twenty-one (21) days to unanimously resolve the dispute and issue a written decision signed by all Parties. If the DRC is unable to unanimously resolve the dispute within this twenty-one (21) day period, the written statement of dispute shall be forwarded to the Senior Executive Committee (SEC) for resolution.

F. The SEC will serve as the forum for resolution of disputes for which agreement has not been reached by the DRC. The EPA's representative on the SEC is the Regional Administrator of EPA Region III. The Navy's representative on the SEC is the Deputy Assistant Secretary of the Navy for Environment and Safety. The SEC members shall, as appropriate, confer, meet and exert their best efforts to resolve the dispute and issue a unanimous written decision signed by all parties. If unanimous resolution of the dispute is not reached within twenty-one (21) days, the EPA Regional Administrator shall issue a written position on the

dispute. The Navy may, within twenty-one (21) days of the Regional Administrator's issuance of EPA's position, issue a written notice elevating the dispute to the Administrator of U.S. EPA for resolution in accordance with all applicable laws and procedures. In the event that Navy elects not to elevate the dispute to the Administrator within the designated twenty-one (21) day escalation period, the decision will become final and the work will proceed in accordance with the Regional Administrator's written position with respect to the dispute.

G. Upon escalation of a dispute to the Administrator of EPA pursuant to Section XVII.F. above, the Administrator will review and resolve the dispute within twenty-one (21) days. Upon request, and prior to resolving the dispute, the EPA Administrator shall meet and confer with the Navy's Secretariat Representative to discuss the issue(s) under dispute. Upon resolution, the Administrator shall provide the other Parties with a written final decision setting forth resolution of the dispute. The duties of the Administrator set forth in this Section shall not be delegated.

H. The pendency of any dispute under this Section shall not affect the Navy's responsibility for timely performance of the work required by this Order, except that the time period for completion of work affected by such dispute shall be extended for a period of time usually not to exceed the actual time taken to resolve any good faith dispute in accordance with the procedures specified herein. All elements of the work required by this Order, which are not affected by the dispute, shall continue to be completed in accordance with the applicable schedule.

I. When dispute resolution is in progress, work affected by the dispute will immediately be discontinued if the Hazardous Waste Management Division Director for EPA Region III requests, in writing, that work related to the dispute be stopped because, in EPA's opinion, such work is inadequate or defective, and such inadequacy or defect is likely to yield an adverse effect on human health or the environment, or is likely to have a substantial adverse effect on the remedy selection or implementation process. To the extent possible, EPA shall consult with the Navy prior to initiating a work stoppage request. After stoppage of work, if the Navy believes that the work stoppage is inappropriate or may have potential significant adverse impacts, the Navy may meet with the EPA to discuss the work stoppage. Following this meeting, and further consideration of the issues, the EPA Division Director will issue, in writing, a final decision with respect to the work stoppage. The final written decision of the U.S. EPA Hazardous Waste Management Division Director may immediately be subjected to formal dispute resolution. Such dispute may be brought directly to either the DRC or the SEC, at the discretion of the Navy.

J. Within twenty-one (21) days of resolution of a dispute pursuant to the procedures specified in this Section, the Navy shall incorporate the resolution and final determination into the appropriate plan, schedule or procedures and proceed to implement this Order according to the amended plan, schedule or procedures.

K. Resolution of a dispute pursuant to this Section of the Order constitutes a final resolution to any dispute arising under this Order. All Parties shall abide by all terms and conditions of any final resolution of dispute obtained pursuant to this Section of this Order.

## XVIII. FORCE MAJEURE AND EXCUSABLE DELAY

A. Navy shall perform the requirements of this Consent Order in the manner and within the time limits set forth herein, unless the performance is prevented or delayed by events which constitute a force majeure. Navy shall have the burden of proving such a force majeure. A force majeure is defined as any event arising from causes not reasonably foreseeable and beyond the control of Navy, which cannot be overcome by due diligence and which delays or prevents performance in the manner or by a date required by this Consent Order. Such events do not include increased costs of performance, changed economic circumstances, reasonably foreseeable weather conditions or weather conditions which could have been overcome by due diligence, or failure to obtain federal, state, or local permits.

B. Navy shall notify EPA, in writing, within seven (7) calendar days after it becomes or should have become aware of any event which Navy claims constitutes a force majeure. Such notice shall estimate the anticipated length of delay, including necessary demobilization and remobilization, its cause, measures taken or to be taken to prevent or minimize the delay, and an estimated timetable for implementation of these measures. Failure to comply with the notice provision of this Section XVIII shall constitute a waiver of Navy's right to assert a force majeure claim with respect to such event. In addition to the above notification requirements, Navy shall undertake all reasonable actions to prevent or to minimize any delay in achieving compliance with any requirement of this Consent Order after it becomes or should have become aware of any event which may delay such compliance.

C. If EPA determines that the failure to comply or delay has been or will be caused by a force majeure, the time for performance of that requirement of this Consent Order may be extended, upon EPA approval, for a period equal to the delay resulting from such force majeure. This shall be accomplished through an amendment to this Consent Order pursuant to Section XXIV, "SUBSEQUENT MODIFICATION." Such an extension shall not

alter the schedule for performance or completion of any other tasks required by this Consent Order, unless these tasks are also specifically altered by amendment of the Consent Order. In the event that EPA and Navy cannot agree that any delay or failure has been or will be caused by a force majeure, or if there is no agreement on the length of the extension, Navy may invoke the dispute resolution procedures set forth in Section XVII, "DISPUTE RESOLUTION."

## XIX. FUNDING

A. It is the expectation of the Parties to this Order that all obligations of the Navy arising under this Order will be fully funded. The Navy agrees to seek sufficient funding through the Department of the Navy budgetary process to fulfill its obligations under this Order.

B. In accordance with CERCLA Section 120(e)(5)(B), 42 U.S.C. Section 9620(e)(5)(B), the Navy shall submit to DoD for inclusion in its annual report to Congress the specific cost estimates and budgetary proposals associated with the implementation of this Order.

C. Any requirement for the payment or obligation of funds, including stipulated penalties, by the Navy established by the terms of this Order shall be subject to the availability of appropriated funds, 10 U.S.C. Section 2703(e), and Defense Authorization Act provisions governing the payment of penalties. No provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Section 1341. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the dates established requiring the payment or obligation of such funds shall be appropriately adjusted.

D. If appropriated funds are not available to fulfill the Navy's obligations under this Order, EPA reserves the right to initiate an action against any other person, or to take any response action, which would be appropriate absent this Order.

E. Funds authorized and appropriated annually by Congress under the Environmental Restoration, Navy appropriation in the Department of Defense Appropriation Act will be the source of funds for activities required by this Order consistent with Section 211 of SARA, 10 U.S.C. Chapter 160. However, should the ER,N appropriation be inadequate in any year to meet the total Navy Installation Restoration Program implementation requirements, the Navy will, in consultation with EPA and

stakeholders, prioritize and allocate that year's appropriation, considering legal requirements pertaining to each site, relative risks to human health and the environment, and other relevant factors.

F. The Parties agreed to this language in this Section with the understanding that it will be revised in accordance with the results of the National EPA/Navy negotiations for the Alleghany Ballistics Laboratory (ABL)"Deadlines and Contents of Site Management Plan", "Budget Development and Amendment of Site Management Plan", and "Funding" provisions of the Agreement.

## XX. RESERVATION OF RIGHTS

A. EPA expressly reserves all rights and defenses that it may have, including the right both to disapprove of work performed by Navy pursuant to this Consent Order, to require that Navy correct or reperform any work disapproved by EPA, and to request that Navy perform tasks in addition to those stated in the Scope(s) of Work, Workplans, or this Consent Order.

B. EPA hereby reserves all of its statutory and regulatory powers, authorities, rights, remedies, both legal and equitable, which may pertain to the Navy's failure to comply with any applicable laws and regulations and with any of the requirements of this Consent Order, including but not limited to, the right both to disapprove of work performed by the Navy and to request that the Navy perform tasks in addition to those stated in the Workplans. This Consent Order shall not be construed as a limitation of any rights, remedies, powers and/or authorities, which EPA has under RCRA, CERCLA, or any other statutory, regulatory or common law authority of the United States.

C. Compliance by Navy with the terms of this Consent Order shall not relieve Navy of its obligations to comply with RCRA or any other applicable local, state, or federal laws and regulations.

D. The signing of this Consent Order and Navy's consent to comply shall not limit or otherwise preclude EPA from taking additional enforcement action pursuant to Section 7003 of RCRA, 42 U.S.C. Section 6973, or any other authority, should EPA determine that such action is warranted.

E. This Consent Order is not intended to be, nor shall it be construed as, a permit. This Consent Order does not relieve Navy of any obligation to obtain and comply with any local, state, or federal permit or approval.

F. EPA reserves the right to perform any portion of the work consented to herein or any additional site characterization,

feasibility study, and response/corrective actions it deems necessary to protect human health or welfare or the environment. EPA may exercise its authority under RCRA, CERCLA or any other authority to undertake or require the performance of response actions at any time.

## XXI. OTHER CLAIMS

Nothing in this Consent Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, or corporation, or other entity for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, solid wastes, pollutants, or contaminants found at, taken to, or taken from the Facility.

## XXII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. Navy shall obtain or require its authorized representatives to obtain all permits and approvals necessary under such laws and regulations.

## XXIII. NOTICE OF NON-LIABILITY OF EPA

EPA shall not be deemed a party to any contract involving Navy and relating to activities at the Facility and shall not be liable for any claim or cause of action arising from or on account of any act, or the omission of Navy, its officers, employees, contractors, receivers, trustees, agents or assigns, in carrying out the activities required by this Consent Order.

## XXIV. SUBSEQUENT MODIFICATION

A. Except as otherwise provided in this Consent Order, this Consent Order may be amended only by mutual agreement of EPA and Navy. Any such amendment shall be in writing, shall be signed by an authorized representative of each party, shall have as its effective date the date on which it is signed by EPA, and shall be incorporated into this Consent Order. Any oral agreement between EPA and Navy, the purpose of which is to modify this Consent Order to address exigent circumstances, and which is subsequently ratified in writing by EPA and Navy, shall have as its effective date the date of such oral agreement.

B. Any reports, plans, specifications, schedules, other submissions and attachments required by this Consent Order are, upon written approval by EPA, incorporated into this Consent Order. Any noncompliance with such EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a violation of this Consent Order and shall subject Navy to the stipulated penalty provisions included in Section XVI, "DELAY IN PERFORMANCE/STIPULATED PENALTIES."

C. Minor modifications in the studies, techniques, procedures, designs or schedules utilized in carrying out this Consent Order and necessary for the completion of the project may be made by written agreement of the Project Coordinators. Such modifications shall have as an effective date the date on which the agreement is signed by the EPA Project Coordinator.

D. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other writing submitted by Navy shall be construed as relieving Navy of its obligation to obtain written approval, if and when required by this Consent Order.

## XXV. SEVERABILITY

If any provision or authority of this Consent Order or the application of this Consent Order to any party or circumstance is held by any judicial or administrative authority to be invalid, the application of such provision to other parties or circumstances and the remainder of this Consent Order shall not be affected thereby and shall remain in full force.

## XXVI. TERMINATION AND SATISFACTION

The provisions of this Consent Order shall be deemed satisfied upon Navy's receipt of written notice from EPA that Navy has demonstrated, to the satisfaction of EPA, that the terms of this Consent Order, including any additional tasks determined by EPA to be required pursuant to this Consent Order, have been satisfactorily completed. This notice shall not, however, terminate Navy's obligation to comply with any continuing obligations.

## XXVII. SURVIVABILITY/PERMIT INTEGRATION

A. Subsequent to the issuance of this Consent Order, a RCRA permit may be issued to WNY incorporating by reference into such permit the requirements of this Consent Order.

B. No requirement of this Consent Order shall terminate upon the issuance of a RCRA permit unless such requirement is expressly replaced by a requirement in the permit.

## XXVIII. EFFECTIVE DATE

The effective date of this Consent Order shall be the date on which Navy receives a true and correct copy of the fully executed Consent Order or a true and correct copy of the fully executed modified Consent Order as provided in Section X, "PUBLIC COMMENT AND RELATED SUBSEQUENT MODIFICATIONS".

**IT IS SO AGREED AND ORDERED:**

DATE: MAR - 5 1997 BY: _____
W. MICHAEL McCABE
REGIONAL ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION III

DATE: 3/6/97 BY: _____
ROBERT B. PIRIE, JR.
ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT AND SAFETY)
NAVY

**Attachment A**

**SUMMARY OF CONTAMINANT FINDINGS**

I. The SITE INVESTIGATION - WASHINGTON NAVY YARD, WASHINGTON, D.C. (SI) dated September 1996 addressed the following thirteen (13) sites, one (1) AOC, the Anacostia River and Washington Navy Yard Basewide groundwater monitoring wells: Buildings 22 (Site 01); 33 (Site 02); 40/41 (Site 03); 46 (Site 04)(includes Buildings 46, 108 and 66/67); 73 (Site 05)(includes Buildings 28, 73, 104, 143 and 176); 116 (Site 06)(includes Buildings 116/118 and 197); 126 (Site 07); 201 (AOC Building 201); 211(Site 08); 219 (Site 09)(includes Buildings 219 and 220); 290(Site 13); 292 (Site 14); the Former Incinerator Site (Site 11)and Admirals Row (Site 10), which includes Quarters B through H, K through P, R through W, Y, Leutze Park and Building 1. Samples were collected in soil, sediment, surface water, and groundwater in the vicinity of each location listed.

A. Section 4.0 of the SI report compares sample analytical data to the relevant risk-based screening criteria, at the sites listed above. The risk-based screening criteria used in the comparison, are:

1. For all soil data - EPA-Region III Risk-Based Concentrations (RBCs) for Industrial and Residential soils;

2. For groundwater data - EPA Maximum Contaminant Levels (MCLs) and, where MCLs are not available, Region III risk-based screening criteria; and

3. For sediment data - Incidence of Adverse Biological Effects within Ranges [Effects Range Low (ERL) and Effects Range Median (ERM)] of Chemical Concentrations in Marine and Estuarine Sediments.

B. Section 4.0 of the SI indicates that the risk-based screening criteria were exceeded for the contaminants noted below at the following 16 areas:

1. Site 01, Building 22, located between Patterson Avenue and Paulding Street near Warrington Avenue. RBC exceedances in subsurface soil at this site: Arsenic - 4.2 and 5.9 ppm (Industrial) and Beryllium - 4.6 and 0.85 ppm (Industrial & Residential-Metals/Cyanide).

2. Site 02, Building 33, located at the intersection of Patterson Avenue and Kennon Street. RBC exceedances in subsurface soil at this site: Arsenic - 4.3, 7.7, 7.8, and 11.2 ppm (Industrial) and Beryllium - 0.66, 0.43, 2.1 and 1.8 ppm (Industrial & Residential-Total Metals). MCL exceedances in groundwater at this site: Lead - 16.5, 23.4 and 51.8 ug/L (MCL-Total Metals).

3. Site 03, Building 40/41, formerly located between Paulding Street and Dahlgren Avenue, parallel to Leutze Park. RBC exceedances in subsurface soil at this site: Arsenic - 4.2 ppm (Industrial) and Beryllium - 4.2 and 1.6 ppm (Industrial-Total Metals).

4. Site 04, Building 46 (includes Buildings 46, 108 and 66/67):

a. Building 46 is located along Harwood Street near the intersection of Harwood Street and N Street.

b. Building 108 is bordered to the east by Building 67, Dahlgren Avenue to the west and Building 44 to the north.

c. Building 66/67 is bordered to the east by Building 46, Building 108 to the west and Building 44 to the north.

RBC exceedances in subsurface soil at this site: Arsenic - 6.4, 7, 6, 3, 3.4, 3.3, 1.7, 6.2 and 8.1 ppm (Industrial & Residential-Metals); Beryllium - 0.86, 0.26, 1.2, 0.87, 1, 1.2, 0.89, 0.93 and 1.3 ppm (Residential-Metals). MCL exceedances in groundwater at this site: Lead - 38.2 ug/L and Nickel - 137 and 532 ug/L (MCL-Total Metals); Nickel - 112 and 262 ug/L (MCL-Dissolved Metals).

5. Site 05, Building 73 includes Buildings 28, 73, 104, 143 and 176. Buildings 73, 104 and 143 are located between Isaac Hull Avenue and Patterson Avenue along Tingey Street. Buildings 28 and 176 are located in Grid Location C-2. Buildings 28, 104, 143 and 176 are designated as Base Realignment and Closure (BRAC) sites. This site was also investigated between November 27 and 29, 1995. RBC exceedances in subsurface soil at this site: Benzo(a)pyrene - 290 ug/Kg (Residential); Arsenic - 6, 6.5, 7.7, 3.6, 1.1, 6.2 and 83.6 ppm (Industrial and Residential-Metals and Total Metals); Lead - 1990, 1710, 2040, and 4420 ppm (Residential-Metals); Beryllium - 0.57, 1.1, 1.1, 0.64, and 0.68 ppm(Residential-Metals) and 0.38 ppm (Residential-Total Metals). Groundwater MCL exceedances: Lead - 1080 & 93.8 ug/L (MCL-Total Metals); Nickel-125 ug/L (MCL-Total Metals); and Nickel-269 ug/L (MCL-Dissolved Metals); Arsenic-61.7 ug/L(MCL-Total Metals); Beryllium-6.9, 4.9, 4.8 ug/L.(MCL-Total and Dissolved metals).

6. Site 06, Building 116 includes Building 116/118 and 197. Buildings 116 and 118 are bordered to the east by Bowyer Street, Pendleton Avenue located to the west and Tingey Street located to the north. Building 197 is located between Bowyer Street and Isaac Hull Avenue in the western

portion of the Navy Yard property. This site was also investigated between November 27 and 29, 1995. Soil RBC exceedances include: Benzo(a)anthracene - 1600 and 930 ug/Kg (Residential); Benzo(a)pyrene - 560, 190, 230, 140, 810, 110 and 1200 ug/Kg (Residential & Industrial); Dibenzo(a,h)anthracene - 140, 190 and 330 ug/Kg (Residential); Benzo(b)fluoranthene - 2200 ug/Kg (Residential); Arsenic - 14, 19.2, 31.1, 8.8, 9.3, 5.3, 9.6 and 18.2 ppm (Industrial-Metals and Total Metals); Beryllium - 0.86, 1.3, 1.1, 0.79, 0.8, 0.75, 0.93 and 0.46 ppm (Residential-Metals & Total Metals); Lead - 730 ppm (Residential-Metals). Groundwater MCL exceedances include: Cadmium - 5.8 ug/L (MCL-Total Metals); Lead - 469 ug/L (MCL-Total Metals); Nickel - 232 ug/L (MCL-Total Metals); Sediment Criteria exceedances include: Naphthalene - 170 and 490 ug/Kg (ERL); 2-Methylnaphthalene - 750 and 920 ug/Kg (ERM); Acenaphthylene-97 ug/Kg (ERL); Acenaphthene - 160 ug/Kg (ERL); Fluorene - 190, 380 and 630 ug/Kg (ERL); Phenanthrene - 2000, 860, and 3100 ug/Kg (ERL and ERM); Anthracene - 410, 200, and 720 ug/Kg (ERL); Fluoranthene - 2800, 700, 3600 and 720 ug/Kg (ERL); Pyrene - 2200, 750 and 3300 ug/Kg (ERL and ERM); Benzo(a)anthracene - 1100, 310, and 1600 ug/Kg (ERL); Chrysene - 1300, 530 and 2100 ug/Kg (ERL); Benzo(a)pyrene - 960 and 1300 ug/Kg (ERL); Dibenzo(a,h)anthracene - 300, 77, and 320 ug/Kg (ERL and ERM); Aroclor -1260 - 20,000, 18,000, and 38,000 ug/Kg (ERM); Arsenic - 51, 12.6, 52.6 and 15 ppm (ERL); Cadmium - 1.4 and 2.4 ppm (ERL); Lead - 376, 57.4, 567 and 97.8 ppm (ERL and ERM); Mercury - 1.2, 0.41, and 0.89 ppm (ERL and ERM); Nickel - 34.2 and 84.7 ppm (ERL); Surface water sample results detected: Aroclor -1260 - 2.2 ug/L (Tap Water); Arsenic - 55.1, 65.4 and 7.9 ug/L (Tap Water & MCL-Metals).

7. Site 07, Building 126 was originally located along Bowyer Street across from Building 116/118. Its current location is near the intersection of O Street and 11th Street. RBC exceedances in subsurface soils at this site: Benzo(a)anthracene - 21,000 and 1200 ug/Kg and Benzo(b)fluoranthene - 22,000 and 1300 ug/Kg (Industrial and Residential); Benzo(a)pyrene - 25,000 and 1000 ug/Kg, Indeno(1,2,3-cd)pyrene - 15,000 ug/Kg (Industrial) and Dibenzo(a,h)anthracene - 450 and 310 ug/Kg (Residential); Arsenic - 4.5 and 11.3 ppm (Industrial-Metals) and Beryllium - 0.62 and 0.54 ppm (Residential-Metals); Groundwater MCL exceedance: Lead - 656 ug/L (MCL-Total Metals).

8. Area of Concern Building 201, Building 201 is located between Isaac Hull Avenue and Patterson Avenue, north of Buildings 198 and 142 and south of Building 176. This AOC was investigated between November 27, 1995 and November 29, 1995. RBC exceedances in subsurface soil at this site; Aroclor -1260 - 420 ug/Kg (Residential); Arsenic

- 26.6 and 3.2 ppm and Beryllium - 1.9 and 0.44 ppm (Industrial and Residential-Total Metals); Lead - 651 and 532 ppm (Residential-Total Metals). Groundwater MCL exceedance: Lead - 51.2 ug/L (MCL-Dissolved Metals).

9. Site 08, Building 211 is located between 10th Street S.E. and Parsons Avenue near the bulkhead along the Anacostia River. RBC exceedances in subsurface soil at this site: Benzo(a)pyrene - 510 and 210 ug/Kg and Dibenzo(a,h)anthracene - 140 and 99 ug/Kg (Residential); Arsenic - 13.6 and 22.4 ppm (Industrial-Metals) and Beryllium - 0.94 and 0.89 ppm (Residential-Metals).

10. Site 09, Building 219 (includes Buildings 219 and 220) are located in the northeast corner of the Navy Yard between 10th Street S.E. and 11th Street S.E. RBC exceedances in subsurface soil at this site: Arsenic - 4.3 and 3.8 ppm (Industrial and Residential- Metals) and Beryllium - 0.68 and 0.59 ppm (Residential-Metals).

11. Site 10, Admirals Row, is the designation given to a group of buildings located along Warrington Avenue. The SI indicates that 35 surface soil samples were collected during Phase I of the investigation of this site that exceeded 400 ppm for Lead. One of those samples detected lead at 9800 ppm. There were 119 surface soil samples collected during Phase II of the investigation of this site that exceeded 400 ppm for lead. Five of those samples exceeded 5,000 ppm for lead, with a maximum concentration of 18,700 ppm.

12. Site 11, Prior to demolition, three incinerators were located south of Building 166 and east of Building 218. RBC exceedances in subsurface soil at this site: Benzo(a)anthracene - 15,000 ug/Kg, Benzo(b)fluoranthene - 20,000 ug/Kg and Dibenzo(a,h)anthracene - 3900 ug/Kg (Industrial); Benzo(a)pyrene - 12,000 and 470 ug/Kg (Industrial and Residential); Arsenic - 5.5, 33.2 and 4.6 ppm (Industrial-Metals); Beryllium - 5.4, 0.63 and 0.67 ppm (Industrial and Residential-Metals); Lead - 851 and 629 ppm (Residential-Metals).

13. Site 13, Building 290 is located south of Admirals Row and north of Building 40/41. Building 290 was not identified as a site in the Preliminary Assessment. It was added by EFA-Chesapeake prior to the Phase II field effort. The building is suspected to have housed PCB-containing equipment in the past. No sample analytical results were included in Section 4.0 of the SI report. Field screening data indicated that no PCBs were present in concentrations greater than 10 mg/L in the soil.

14. Site 14, Building 292 is located east of Willard Park. RBC exceedances in surface soil at this site: Aroclor -1260 -3600, 20,000 and 14,000 ug/Kg (Industrial).

15. In addition to the 13 aforementioned sites and one (1) AOC, samples were collected from a basewide network of groundwater monitoring wells and soil borings. Groundwater sample results exceeded: Chloroform - 12 and 3 ug/L (Tap Water); Benzo(a)anthracene - 1 and 2 ug/L (Tap Water); Bis(2-ethylhexyl)phthalate - 5 and 8 ug/L (Tap Water); Benzo(b)fluoranthene, Benzo(k)fluoranthene and Benzo(a) pyrene - all 1 and 2 ug/L (Tap Water); Chloroform - 2.5 and 2.4 ug/L (Tap Water); Indeno(1,2,3-cd)pyrene - 1 ug/L (Tap Water); Arsenic - 9.8, 6, 15.2, 31.2, 6.2, 30.8, 25.6, 10.6, 6.2, 5.1, 2, 3.3, 3.5 ug/L (Tap Water-Total and Dissolved Metals); Beryllium - 7.8, 6.3, 5.9, 3.7, 6.2, 2.4, 4.7, 5.8, 7.5, 3.3, 1.3, 1.2, 1.5, 1.3 and 1.1 ug/L (Tap Water and MCL-Total and Dissolved Metals); Lead - 15.3, 57.2, 290, 36.6, 169, 2950, 29 and 15.9 ug/L (MCL-Total Metals); Antimony - 12.3, 13.4 and 15.4 ug/L (Tap Water and MCL-Dissolved Metals). RBC exceedances in subsurface soil: Benzo(a)anthracene - 1500 and 2600 ug/Kg (Residential); Benzo(b)fluoranthene - 1000 and 2700 ug/Kg; Indeno(1,2,3 - cd)pyrene - 1100 ug/Kg and Dibenzo(a,h)anthracene - 380 and 670 ug/Kg (Residential); Benzo(a)pyrene - 1100 and 2000 ug/Kg (Industrial); Arsenic - 7.7, 2.9, 7.2, 2, 4.3 and 4.6 ppm (Industrial and Residential-Metals). Beryllium - 1.2, 0.93, 1.1, 0.94, 0.81 and 1.3 ppm (Residential-Metals).

16. The SI also includes analytical results associated with the samples collected from the Anacostia River. The investigation of the Anacostia River was conducted between June 5, 1995 and June 17, 1995. During the investigation, seven sediment samples were collected. Anacostia River sediment sample results exceeded: Naphthalene - 520 and 960 ug/Kg (ERL); 2-Methylnaphthalene - 100, 500 and 740 ug/Kg (ERL and ERM); Acenaphthylene - 490, 130, 300, 380 and 260 ug/Kg (ERL); Acenaphthene - 2600, 330, 110, 410, 740 and 270 ug/Kg (ERL and ERM); Fluorene - 3300, 620, 130, 540, 1300, 420 and 170 ug/Kg (ERL and ERM); Phenanthrene - 12,000, 2900, 850, 3200, 11,000, 2800 and 430 ug/Kg (ERL); Anthracene - 5800, 1400, 280, 790, 700 and 540 ug/Kg (ERL); Fluoranthene - 10,000, 4700, 1600, 5100, 13,000 and 4900 ug/Kg (ERL); Pyrene -10,000, 5200, 1600, 5000, 10,000 and 5300 ug/Kg (ERL); Benzo(a)anthracene - 5300, 2700, 700, 1900, 860 and 2300 ug/Kg (ERL); Chrysene - 4800, 4200, 1200, 2700, 3100 and 1400 ug/Kg (ERL); Benzo(a)pyrene - 3300, 2400, 820, 1700, 950 and 2300 ug/Kg (ERL); Dibenzo(a,h)anthracene - 590, 810, 210, 610, 210, and 310 ug/Kg (ERL); Aroclor -1260 - 12,000, 130, 300, 120, and 130 ug/Kg (ERL); Arsenic - 8.5 and 9.2 ppm (ERL); Cadmium - 1.8, 1.4 and 1.4 ppm (ERL); Lead - 234, 186, 201, 155, 120, 126

and 75.1 ppm (ERL); Mercury - 2.7, 0.39, 0.26 and 0.35 ppm (ERL); Nickel - 35.1, 40.7, 34.7, 39.8, 31.7 and 27 ppm (ERL).

II. The report entitled: A Brief Review and Analysis of Recent Heavy Metals and PCB Data Lower Anacostia River, ("Brief Review") EPA Region III, Environmental Programs Branch, October, 1995, presents and briefly discusses the data from the Special Sampling Investigation, Washington Navy Yard and Environs, prepared by EPA Region III, Environmental Programs Branch dated April 24 through 27, 1995 ("SSI"), and compares it to Anacostia River bottom sediment data gathered for the earlier ICPRB Report. The report concludes:

A. Cadmium: Levels of cadmium in river bottom sediment varied from 1-3 ppm with the maximum occurring just above the S. Capitol St. Bridge. Concentrations varied by about an order of magnitude in the storm sewers at WNY. The concentrations found at SAR-5 averaged about 1 ppm.

B. Chromium: Chromium values for river bottom sediment varied between 100-150 ppm. A few, considerably higher values (200-250 ppm) were found in WNY storm sewers.

C. Copper: The range of values in WNY storm sewers extends to 1400 ppm. Such levels may reflect industrial operations, particularly plating, that were once carried out at WNY.

D. Lead: All of the compiled data suggest that lead is one of the more critical parameters monitored during these studies. Virtually all of the ambient data exceeds EPA sediment quality guidelines ("SQG"), in some cases by about a factor of four (400 ppm vs 100 ppm). WNY has certain storm sewers containing between 1000 ppm and 5000 ppm lead, compared to the SQG of 110 ppm. Lead is another metal widely used at WNY during its heavy manufacturing period.

E. Mercury: One of the storm sewers at WNY (Outfall 10) had a mercury concentration of 31.7 ppm.

F. Nickel: Maximum values in the storm sewers were between 200 ppm and 400 ppm. The abundance of nickel in the storm sewers suggests that it may have been a key ingredient in the earlier manufacturing operations, including plating.

G. Zinc: WNY displayed great range in storm sewer concentrations, with a highest overall value of 5000 ppm detected in Outfall 4. Four other sewers showed zinc levels of 1000 ppm or more. The EPA SQG is 270 ppm.

H. PCB: Residue in one sewer at WNY (Outfall 10) has a PCB concentration of 87 ppm wet weight or 227 ppm dry weight. This is well above the TSCA regulatory threshold of 10 ppm. This sewer drains an area, which includes Building 137 (now demolished), once used as a PCB storage site. A soil sample collected where Building 137 once stood showed a PCB level of 210 ppm. Building 197, another area of PCB storage, is also fairly close to this storm sewer.

EPA's samples in its report entitled A Brief Review and Analysis of Recent Heavy Metals and PCB Data Lower Anacostia River were limited to samples taken from storm sewers located at the WNY and the SEFC. Sampling conducted by EPA referenced in this Report did not include other sources along the Anacostia River. According to the Report, during a recent compliance inspection by EPA, active discharges to the environment of hazardous waste or material containing PCBs were not observed. However, EPA will evaluate the results of past releases of hazardous wastes and PCBs during the RFI.

Attachment B

# RCRA FACILITY INVESTIGATION
# SCOPE OF WORK

## PURPOSE

The purpose of this RCRA Facility Investigation ("RFI") is to determine the nature and extent of releases of solid wastes, hazardous wastes or hazardous constituents from regulated units, solid waste management units, and other source areas at the Facility, and to gather all necessary data to support the Corrective Measures Study. The RFI includes the collection of site specific data to evaluate any human health and or ecological impacts of contamination from the site. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA remedial investigation.

## SCOPE

The RCRA Facility Investigation consists of seven tasks:

**TASK I: DESCRIPTION OF CURRENT CONDITIONS**

A. Facility Background
B. Nature and Extent of Contamination
C. Implementation of Interim Measures

**TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURES TECHNOLOGIES**

**TASK III: RFI WORKPLAN REQUIREMENTS**

A. Project Management Plan
B. Data Collection Quality Assurance Plan
C. Data Management Plan
D. Community Relations Plan

**TASK IV: FACILITY INVESTIGATION**

A. Environmental Setting
B. Source Characterization
C. Contamination Characterization
D. Potential Receptor Identification
E. Risk Assessment

TASK V: INVESTIGATION ANALYSIS

A. Data Analysis
B. Protection Standards

TASK VI: LABORATORY AND BENCH-SCALE STUDIES

TASK VII: REPORTS
A. Preliminary (Task) I Report and RFI Workplan
B. Progress
C. Draft and Final

## TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for EPA approval a report providing the background information pertinent to the facility, the nature of contamination, and the interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

### A. Facility Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:

   a. General geographic location;

   b. Property lines, with the owners of all adjacent property clearly indicated;

   c. Topography (with a contour interval of 10 feet and a scale of 1 inch = 100 feet), waterways, all wetlands, floodplains, water features, drainage patterns;

   d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;

   e. All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;

f. All known past solid or hazardous waste treatment, storage, or disposal areas and all known spill, fire, or other accidental release locations regardless of whether they were active on November 19, 1980;

g. All known past and present product and waste underground tanks or piping;

h. Surrounding land uses (residential, commercial, agricultural, recreational); and

i. Location of all production and ground water monitoring wells. These wells shall be clearly labeled. Ground and top of casing elevations shall be included (these elevations may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 C.F.R. Section 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. History and description of ownership and operation, solid and hazardous waste generation, and treatment, storage, and disposal activities at the facility;

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location of the spills, and a description of the response actions conducted (local, state, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. Summary of past permits requested and/or received, any enforcement actions and their subsequent responses.

B. Nature and Extent of Contamination

The Respondent shall prepare and submit for EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected

source areas of contamination. For each area, the Respondent shall identify the following:

a. Location of unit/area (which shall be depicted on a facility map);

b. Quantities of solid and hazardous wastes;

c. Hazardous waste or hazardous constituents, to the extent known; and

d. Identification of areas where additional information is necessary.

2. The Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;

b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

c. Potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

C. Implementation of Interim Measures

The Respondent's report shall document interim measures which were, or are, being undertaken at the facility. This report shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the facility;

2. Design, construction, operation, and maintenance requirements;

3. Schedules for design, construction, and monitoring; and

4. Schedule for progress reports.

## TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURES TECHNOLOGIES

Prior to starting the facility investigation, the Respondent shall submit to EPA a report that identifies the potential corrective measures technologies known to Respondent at the time of report submittal that may be used on site or off site for the containment, treatment, remediation, and/or disposal of contamination. This report also shall identify any field, laboratory, bench- or pilot-scale data that needs to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

## TASK III: RFI WORKPLAN REQUIREMENTS

The Respondent shall prepare a RCRA Facility Investigation Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility-specific situation. The RFI Workplan shall include the following:

A. Project Management Plan

The Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Data Collection Quality Assurance Plan

The Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The Data Collection Strategy section of the Data Collection Quality Assurance Plan shall include, but not be limited to, the following:

a. Description of the intended uses for the data and of the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;

c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:

   i) Environmental conditions at the time of sampling;

   ii) Number of sampling points;

   iii) Representativeness of selected media; and

   iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

   i) RFI data generated by the Respondent over some time period;

   ii) RFI data generated by an outside laboratory or consultant versus data generated by the Respondent;

   iii) Data generated by separate consultants or laboratories; and

   iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule of and information to be provided in quality assurance reports. The reports should include, but not be limited to:

i) Periodic assessment of measurement data accuracy, precision, and completeness;

ii) Results of performance audits;

iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

i. Documenting field sampling operations and procedures, including:

i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);

ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;

v) Collection of replicate samples;

vi) Submission of field-biased blanks, where appropriate;

vii) Potential interferences present at the facility;

viii) Construction materials and techniques associated with monitoring wells and piezometers;

ix) Field equipment listing and sample containers;

x) Sampling order; and

xi) Decontamination procedures.

j. Selecting appropriate sample containers;

k. Sample preservation; and

l. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurement should be conducted;

e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of field measurement and length of field measurement periods; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements will be made; and

ix) Decontamination procedures.

4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, to obtain documents of shipment, and to verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation, and reporting;

g. Internal quality control checks, laboratory performance and systems audits, and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

A performance audit will be conducted by EPA on the laboratories selected by the Respondent. If EPA requires, this audit must be completed and approved prior to the facility investigation.

h. Preventive maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

C. Data Management Plan

The Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This Plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis ID number;

e. Property or component measured; and

f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area and areas where more data are required;

c. Display levels of contamination at each sampling location for each sampling event;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth, or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors.

D. Community Relations Plan

The Respondent shall prepare a plan for the dissemination of information to the public regarding investigation activities and results.

**TASK IV: FACILITY INVESTIGATION**

The Respondent shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); identify actual or potential receptors, and determine the impact(s) of contamination on human health and/or ecological receptors (Risk Assessment). For reporting of the ecological assessment refer to "The Risk Assessment Volume II Manual", [EPA/540/1-89/002 and 001, March 1989].

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measures alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility. The Respondent shall characterize the following:

1. Hydrogeology

The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. Description of the regional and facility-specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility, including:

i) Regional and facility-specific stratigraphy: description of strata, including strike and dip, and identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

iii) Depositional history;

iv) Identification and characterization of areas and amounts of recharge and discharge;

v) Regional and facility-specific ground water flow patterns;

vi) Facility-specific ground water flow patterns in the saturated soil horizon, the shallow bedrock aquifer, and the deep bedrock aquifer systems; and

vii) Characterization of seasonal variations in each ground water flow regime.

b. Analysis of any topographic features that might influence the ground water flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis.)

c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility

(i.e., the aquifers and any intervening saturated and unsaturated units), including:

i) Hydraulic conductivity and porosity (total and effective);

ii) Lithology, grain size, sorting, and degree of cementation;

iii) Interpretation of hydraulic interconnections between saturated zones; and

iv) Attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways, identifying:

i) Sand and gravel deposits in unconsolidated deposits;

ii) Zones of fracturing or channeling in unsolidated or unconsolidated deposits;

iii) Zones of high permeability or low permeability that might direct and/or restrict the flow of contaminants;

iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and

v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation.

e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description

of water level or fluid pressure monitoring, including:

i) Water-level contour and/or potentiometric maps;

ii) Hydrologic cross-sections showing vertical gradients;

iii) The flow system, including the vertical and horizontal components of flow; and

iv) Any temporal changes in hydraulic gradients, for example, due to seasonal influences.

f. Description of man-made influences that may affect the hydrogeology of the site, identifying:

i) Active and inactive local water supply and production wells with an approximate schedule of pumping; and

ii) Man-made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

The Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include, but not be limited to, the following information:

a. Soil Conservation Service (SCS) soil classification;

b. Surface soil distribution;

c. Soil profile, including American Standard Test Method (ASTM) classification of soils;

d. Transects of soil stratigraphy;

e. Hydraulic conductivity (saturated and unsaturated);

f. Relative permeability;

g. Bulk density;

h. Porosity;

i. Soil sorptive capacity;

j. Cation exchange capacity (CEC);

k. Soil organic content;

l. Soil pH;

m. Particle size distribution;

n. Depth of water table;

o. Moisture content;

p. Effect of stratification on unsaturated flow;

q. Infiltration;

r. Evapotranspiration;

s. Storage capacity;

t. Vertical flow rate; and

u. Mineral content.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

iii) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100-year event);

iv) Drainage patterns; and

v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH3, NO3-/NO2- PO4-3), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics, including:

i) Deposition area;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Respondent shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

a. Description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;

vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. Description of topographic and man-made features which affect air flow and emission patterns, including:

i) Ridges, hills, or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g., rivers, lakes, bays, etc.);

iv) Wind breaks and forests; and

v) Buildings.

B. Source Characterization

The Respondent shall collect analytical data to supplement and update the description prepared pursuant to Task I.B. herein. The data shall completely characterize the wastes and the areas where wastes have been placed, including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security and engineered barriers). This information shall include quantification of the following specific characteristics at each source area:

1. Unit/Disposal Area Characteristics:

a. Location of unit/disposal area;

b. Type of unit/disposal area;

c. Design features;

d. Operating practices (past and present);

e. Period of operation;

f. Age of unit/disposal area;

g. General physical conditions; and

h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste/product placed in the unit:

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing, or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics:

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

vii) Density;

viii) Boiling point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the waste; and

xii) Vapor pressure.

c. Migration and dispersal characteristics of the waste/product:

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

The Respondent shall collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the facility:

1. Ground Water Contamination

The Respondent shall conduct a ground water investigation to fully characterize all plumes of contamination at the facility. This investigation shall, at a minimum, provide the following information:

a. Specific origin (source) of each contaminant plume;

b. Description of the full horizontal and vertical extent of each immiscible or dissolved plume(s) originating from the facility;

c. Horizontal and vertical direction of contaminant movement;

d. Velocity of contaminant movement;

e. Horizontal and vertical concentration profiles of "Appendix IX constituents" (see 40 C.F.R. Section Part 264, App. IX) in the plume(s);

f. Evaluation of factors influencing the plume movement; and

g. Extrapolation of future contaminant movement.

The Respondent shall document the procedures used to characterize contaminant plume(s), for example, geophysics, modeling, pump tests, slug tests, nested piezometers, etc.

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. Specific origin (source) of each soil contamination area;

b. Description of the full vertical and horizontal extent of contamination;

c. Description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation;

d. Specific contaminant concentrations;

e. Velocity and direction of contaminant movement; and

f. Extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The investigation shall include, but not be limited to, the following information:

a. Specific origin (source) of each contaminant release to surface water;

b. Description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;

c. Horizontal and vertical direction of contaminant movement;

d. Contaminant velocity;

e. Evaluation of the physical, biological, and chemical factors influencing contaminant movement;

f. Extrapolation of future contaminant movement; and

g. Description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

The Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

The Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

a. Specific origin (source) of each contaminant release to the air;

b. Description of the horizontal and vertical extent and velocity of contaminant movement;

c. Rate and amount of the release; and

d. Chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous wastes,hazardous constituents and/or solid wastes in the ground water. This investigation shall include the following information:

a. Specific origin (source) of each release of subsurface gas contaminants;

b. Description of the horizontal and vertical extent of subsurface gas mitigation;

c. Chemical composition of the gases being emitted;

d. Rate, amount, and density of the gases emitted; and

e. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

D. Potential Receptor Identification

The Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

b. Location of ground water users, including wells and discharge areas.

2. Local uses and possible future uses of surface waters draining from the facility:

   a. Domestic and municipal (e.g., potable and lawn/garden watering);

   b. Recreational (e.g., swimming, fishing);

   c. Agricultural;

   d. Industrial; and

   e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including, but not limited to:

   a. Recreation;

   b. Hunting;

   c. Residential;

   d. Commercial;

   e. Zoning; and

   f. Relationship between population locations and prevailing wind direction.

4. A description of the ecology overlying and adjacent to the facility must include:

   a. Location and size of each identified habitat (e.g., stream reaches, roads, wetlands, or forested areas) within the physical boundaries defined for the assessment; and

   b. Listing and physical assessment of the ecosystems and population potentially exposed to contamination.

5. An evaluation of the pollutant impacts on the ecosystems/populations potentially exposed to contamination. This evaluation may be accomplished through the use of toxicity test (acute and chronic) population surveys and literature reviews.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age, sex, and sensitive subgroups.

7. A description of the significance, uniqueness, or protected status of potentially exposed ecosystems.

E. Risk Assessment

The baseline risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (under the assumption of no action). The baseline risk assessment contributes to the site characterization and subsequent development, evaluation, and selection of appropriate response alternatives. There are four steps in the risk assessment process:

1. Determine contaminants of concern: Data collection and evaluation involves gathering and analyzing the site data relevant to the human health evaluation and identifying the substances present at the site that are the focus of the risk assessment process.

2. Exposure assessment: Using the procedure outlined in Section D for determining potential receptors, estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. In the exposure assessment, reasonable maximum estimates of exposure are developed for both current and future land-use assumptions.

3. Toxicity assessment: This component of the risk assessment considers the types of adverse health effects associated with chemical exposures and the relationship between the magnitude of exposure and adverse effects.

4. Risk Characterization: This summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risk, both in quantitative expressions and qualitative statements.

## TASK V: INVESTIGATION ANALYSIS

The Respondent shall prepare an analysis and summary of all facility investigations and the results of such investigations. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

The Respondent shall analyze all facility investigation data outlined in Task IV "FACILITY INVESTIGATION" and prepare a report on the type and extent of contamination at the facility, including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative of the area.

B. Protection Standards

1. Ground Water Protection Standards

For regulated units, the Respondent shall provide information to support the Agency's selection/ development of Ground Water Protection Standards for all of the Appendix VIII constituents found in the ground water during the RCRA Facility Investigation (Task IV).

a. The Ground Water Protection Standards shall consist of:

i) Maximum Contaminant Level (MCL) for any constituents with an EPA promulgated Maximum Contaminant Level (MCL), if the background level of the constituent is below the value of the EPA-approved MCL; or

ii) Background level of that constituent in the ground water; or

iii) EPA-approved Alternate Concentration Limit (ACL).

b. Information to support the EPA's selection of Alternate Concentration Limits (ACLs) shall be developed by the Respondent in accordance with applicable EPA guidance. For any proposed ACLs, the Respondent shall include a justification based upon the criteria set forth in 40 C.F.R. Section 264.94(b).

c. The EPA shall notify the Respondent, in writing, of approval, disapproval, or modifications. The EPA shall specify, in writing, the reason(s) for any disapproval or modification.

d. Within thirty (30) calendar days of receipt of EPA's notification of disapproval of any proposed ACLs, the Respondent shall amend and submit revisions to EPA.

2. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

**TASK VI: LABORATORY AND BENCH-SCALE STUDIES**

Based on the EPA approved report submitted pursuant to Task II of this order, the Respondent shall conduct laboratory and/or bench-scale studies to determine the applicability of corrective measures technology or technologies to facility conditions. The Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience, to determine the testing requirements.

The Respondent shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation. Upon completion of the testing, the Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Respondent shall prepare a report summarizing the testing program and its results, both positive and negative.

## TASK VII: REPORTS

A. Preliminary (Task I) Report and RFI Workplan

The Respondent shall submit to the EPA reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

B. Progress

The Respondent shall, at a minimum, provide the EPA with signed, bimonthly progress reports containing:

1. Description and estimate of the percentage of the RFI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the RFI during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or state government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. Draft and Final

Upon EPA approval, the Respondent shall prepare a RCRA Facility Investigation Report to present Tasks IV-V. The RCRA Facility Investigation Report shall be developed in draft form for EPA review. The RCRA Facility Investigation Report shall be developed in final format, incorporating comments received on the Draft RCRA Facility Investigation Report. Task VI shall be submitted as a separate report when the Final RCRA Facility Investigation Report is submitted.

The original and four copies of all reports, including the Task I report, Task II report, Task III workplan, Task VI report and both the Draft and Final RCRA Facility Investigation Reports (Tasks IV-V) shall be provided by the Respondent to EPA.

Attachment C

# CORRECTIVE MEASURES STUDY
# SCOPE OF WORK

## PURPOSE

The purpose of this Corrective Measures Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at the facility. The Respondent shall furnish the personnel, materials, and services necessary to prepare the Corrective Measures Study, except as otherwise specified.

## SCOPE

The Corrective Measures Study consists of four tasks:

**TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE MEASURES ALTERNATIVE OR ALTERNATIVES**

A. Description of Current Situation
B. Establishment of Corrective Action Objectives
C. Screening of Corrective Measures Technologies
D. Identification of the Corrective Measures Alternative or Alternatives

**TASK II: EVALUATION OF THE CORRECTIVE MEASURES ALTERNATIVE OR ALTERNATIVES**

A. Technical/Environmental/Human Health/Institutional
B. Cost Estimate

**TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES**

A. Technical
B. Human Health
C. Environmental

**TASK IV: REPORTS**

A. Progress
B. Draft
C. Final

## TASK II: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measures Technologies (Task II), Respondent shall identify, screen, and develop the alternative or alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the objectives established for the corrective action.

### A. Description of Current Situation

Respondent shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. Respondent shall provide an update to information presented in Task I of the RCRA Facility Investigation, "DESCRIPTION OF CURRENT CONDITIONS," to the Agency regarding previous response activities and any interim measures which have or are being implemented at the facility. Respondent shall also make a facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

### B. Establishment of Corrective Action Objectives

Respondent, in conjunction with the EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environment criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground water releases from regulated units must be consistent with, and as stringent as, those required under 40 C.F.R. 264.100.

### C. Screening of Corrective Measures Technologies

Respondent shall review the results of the RCRA Facility Investigation and reassess the technologies specified in the Task II report as approved by EPA and identify additional technologies which are applicable at the facility. Respondent shall screen the preliminary corrective measures technologies identified in Task II of the RCRA Facility investigation and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measures objective within a reasonable time period. This screening process

focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. The use of technologies which are clearly precluded by site characteristics should be eliminated from further consideration.

2. Waste Characteristics

Waste characteristics particularly affect the feasibility of remediating waste by utilizing in-situ methods, direct treatment methods, or land disposal (on-/off-site) methods. Therefore, identification of waste characteristics that limit the effectiveness or feasibility of remediating technologies is an important part of the screening process. Remediating technologies clearly limited by these waste characteristics should be eliminated from consideration.

3. Technology Limitations

During the screening process, the level of technological development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. <u>Identification of the Corrective Measures Alternative or Alternatives</u>

Respondent shall develop the corrective measures alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measures Technologies as presented in Task II of the RCRA Facility Investigation and as supplemented following the preparation of the RCRA Facility Investigation Report. Respondent shall rely on engineering practice to determine which of the previously

identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to address adequately all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

## TASK III: EVALUATION OF THE CORRECTIVE MEASURES ALTERNATIVE OR ALTERNATIVES

Respondent shall describe each corrective measures alternative that passes through the initial screening in Task I and evaluate each corrective measures alternative and its components. The evaluation shall be based on technical, environmental, human health, and institutional concerns. Respondent shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Respondent shall provide a description of each corrective measures alternative which includes, but is not limited to, the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. Respondent shall evaluate each alternative in the following four areas:

1. Technical

Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability, and safety.

a. Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measures, described below:

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness

shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measures technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technologies, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. Respondent shall provide information on the reliability of each corrective measure, including their operation and maintenance requirements and their demonstrated reliability, described below:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies has been used effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the

flexibility to deal with uncontrollable changes at the site.

c. Respondent shall describe the implementability of each corrective measure, including the relative ease of installation (constructability) and the time required to achieve a given level of response, described below:

i) Constructability is determined by conditions both internal and external to the facility conditions and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually obtain beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. Respondent shall evaluate each corrective measures alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments, as well as to the safety of workers during implementation. Factors to consider include, but are not limited to, fire, explosion, and exposure to hazardous substances.

2. Environmental

Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will

include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health

Respondent shall assess each alternative in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health, both during and after implementation of the corrective measures. The assessment will describe the levels and characterizations of contaminants on site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and its reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional

Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, state, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations, including requirements for construction and operating permits, on the design, operation, and timing of each alternative.

B. Cost Estimate

Respondent shall develop an estimate of the cost of each corrective measures alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

a. Direct capital costs include:

i) Construction costs: costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measures;

ii) Equipment costs: costs of treatment, containment, disposal, and/or service equipment necessary to implement the action;

iii) Land and site-development costs: expenses associated with purchase of land and development of existing property; and

iv) Buildings and services costs: costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i) Engineering expenses: costs of administration, design, construction supervision, drafting, and testing of corrective measures alternatives;

ii) Legal fees and license or permit costs: administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii) Startup and problem solving immediately following startup (shakedown) costs: costs incurred during corrective measures startup; and

iv) Contingency allowances: funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. Respondent shall consider the following operation and maintenance cost components:

a. Operating labor costs: wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

b. Maintenance materials and labor costs: costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: costs of items such as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs: costs associated with administration of corrective measures operation and maintenance not included under other categories;

g Insurance, taxes, and licensing costs: costs of such items as liability and sudden accident insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: items that do not fit any of the above categories.

## TASK III. JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

Respondent shall justify and recommend a corrective measures alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors among the alternatives evaluated shall be highlighted. The EPA will select the corrective measures alternative or alternatives to be implemented, based on the results of Tasks I and II. At a minimum, the following criteria shall be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective in performing the intended functions and maintaining the performance over extended periods of time shall be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have been proven to be effective under waste and facility conditions similar to those anticipated shall be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time shall be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments, as well as to workers, during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure over time shall be preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time, on the environment, shall be favored.

## TASK IV: REPORTS

Respondent shall prepare a Corrective Measures Study Report presenting the results of Tasks I through III and recommending a corrective measures alternative. Four copies of the preliminary report shall be provided by Respondent.

A. Progress

Respondent shall, at a minimum, provide the EPA with signed, bimonthly progress reports containing:

1. Description and estimate of the percentage of the CMS completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or state government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Draft

The Report shall, at a minimum, include:

1. Description of the facility:

   a. Site topographic map and preliminary layouts.

2. Summary of the corrective measure or measures:

   a. Description of the corrective measure or measures and rationale for the selection(s);

   b. Performance expectations;

   c. Preliminary design criteria and rationale;

   d. General operation and maintenance requirements; and

   e. Long-term monitoring requirements.

3. Summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures:

   a. Field studies (ground water, surface water, soil); and

   b. Laboratory studies (bench scale, pick scale).

4. Design and implementation precautions:

   a. Special technical problems;

   b. Additional engineering data required;

   c. Permits and regulatory requirements;

   d. Access, easements, right-of-way;

   e. Health and safety requirements; and

   f. Community relations activities.

5. Cost estimates and schedules:

   a. Capital cost estimate;

   b. Operation and maintenance cost estimate; and

   c. Project schedule (design, construction, operation).

The original and four copies of the draft shall be provided by Respondent to EPA.

C. Final

Respondent shall finalize the Corrective Measures Study Report, incorporating comments received from EPA on the Draft Corrective Measures Study Report.

## Attachment D

## HEALTH AND SAFETY PLAN

The Respondent shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

   a. Facility description including availability of resources such as roads, water supply, electricity, and telephone service;

   b. Description of the known hazards and evaluations of the risks associated with the incident and with each activity conducted, including, but not limited to, on- and off-site exposure to contaminants;

   c. List of key personnel and alternates responsible for site safety, response operations, and protection of public health;

   d. Delineation of work area;

   e. Description of levels of protection to be worn by personnel in work area;

   f. Establishment of procedures to control site access;

   g. Description of decontamination procedures for personnel and equipment;

   h. Establishment of site emergency procedures;

   i. Emergency medical care for injuries and toxicological problems;

   j. Description of requirements for an environmental surveillance program;

   k. Routine and special training required for responders; and

   l. Establishment of procedures for protecting workers from weather-related problems.

2. The facility Health and Safety Plan shall be consistent with:

   a. NIOSH Occupational Safety and Health Guidance Manual For Hazardous Waste Site Activities (1985);

   b. EPA Order 1440.3 - Respiratory Protection;

c. EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984);

f. OSHA regulations, particularly in 29 C.F.R. 1910 and 1926;

g. State and local regulations; and

h. Other EPA guidance as provided.

3. The Health and Safety Plan must be revised to address any additions and/or changes in planned activities.

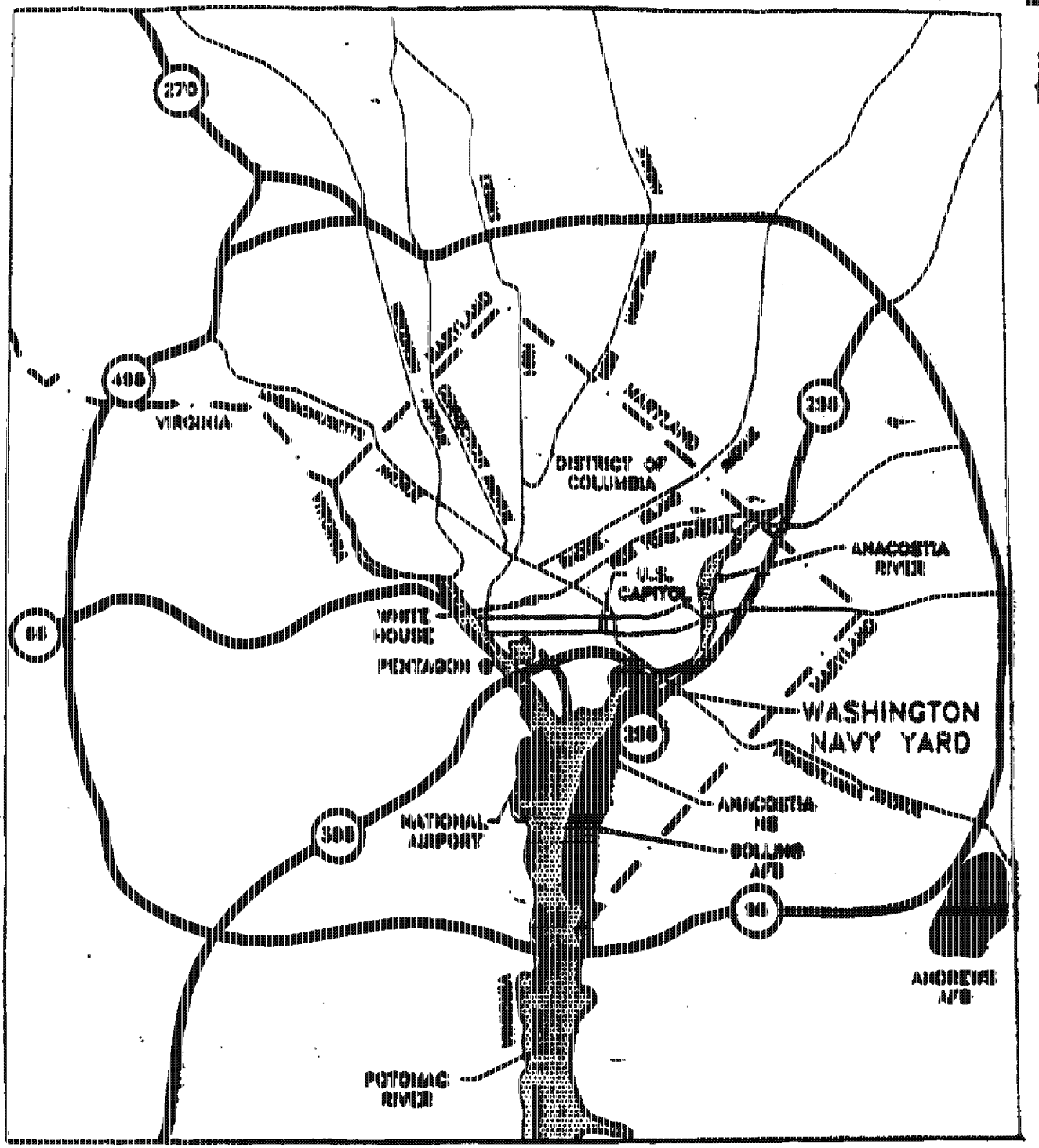


FIGURE 2-1
SITE LOCATION MAP
SITE INVESTIGATION

SOURCE: MODIFIED FROM BASE COMPREHENSIVE PLAN, 1991

WASHINGTON NAVY YARD
WASHINGTON, D.C.

FIGURE 2-3
SITE GRID LOCATION MAP
SITE INVESTIGATION
WASHINGTON NAVY YARD
WASHINGTON, D.C.